Bulletin

of the International Society of Soil Science

Bulletin

de l' Association Internationale de la Science du Sol

Mitteilungsblatt

der Internationalen Bodenkundlichen Gesellschaft

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Seat/Siège/Sitz: c/o Institut für Bodenforschung, Universität für Bodenkultur, Gregor-Mendel-Strasse 33, A-1180 Vienna, Austria. Phone: +43 1 3106026; Fax.: +43 1 3106027.

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Editor: Prof.Dr. Winfried E.H. Blum
Secretary-General of ISSS
Universitaet fuer Bodenkultur
Gregor Mendel-Str. 33
A-1180 Vienna/Austria

Co-Editor and Book Review Editor:
Drs. J. Hans V. van Baren
Deputy Secretary-General of ISSS
ISRIC, P.O. Box 353
6700 AJ Wageningen/The Netherlands
(all correspondence concerning book reviews should be sent to this address)

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16

du 20 au 26 août 1998
august 20 to 26 1998
vom 20. bis 26. august 1998

CONGRES MONDIAL DE SCIENCE DU SOL
WORLD CONGRESS OF SOIL SCIENCE
BODENKUNDLICHER WELTKONGRESS

Montpellier

FRANCE

Infographie

The French Society of Soil Science (AFES) invites you to participate in the

16TH WORLD CONGRESS OF SOIL SCIENCE
IN MONTPELLIER, FRANCE

August 20-26, 1998

The Congress will take place at the **Corum,** Palais des Congrès of Montpellier. Its general theme is:

"Present Functioning of World Pedological Systems
in Relation with the Various Types of Land Use by Human Societies"

The Congress will consist of:

- 5 introductory papers
- 45 symposia
- poster sessions
- working sessions of the Commissions, Sub-Commissions, Working Groups and Standing Committees of ISSS
- scientific and technical expositions
- scientific excursions in the Montpellier region

Before and after the Congress, there will be several scientific excursions. Each of these excursions will take one week and will visit:

- various regions within France
- European neighbouring countries of France
- countries of northern Africa
- countries of tropical Africa

The first detailed announcement of the Congress Programme, including a preliminary registration form, will be published in Bulletin No. 88 (1995/2) of the ISSS, which will be printed in autumn 1995.

The definitive Congress Programme will be decided upon by the ISSS Council during its meeting in Montpellier, from April 9-12, 1996. Immediately after the meeting, this programme will be distributed to all members of ISSS, all National Soil Science Societies, all Scientific Union Members of the International Council of Scientific Unions (ICSU), all scientific and technical institutions and all other entities interested in soils.

Propositions for presentations (within the Symposia or as posters), in the form of one-page summaries, have to be sent to the Organizing Committee of the Congress before **April 30, 1997.** The Scientific Committee of the Congress will evaluate and select the papers, in cooperation with the Symposia Chairpersons. The complete texts of the selected papers have to be submitted before **December 31, 1997.**

For those who register for the Congress before December 31, 1997, the registration fees will be approx. 2000 Ffr. per person (approx. 380 US$ at the actual exchange rate). For those who apply after December 31, 1997, the fee will be 20 % higher. Students will pay a reduced registration fee. Authors of papers are obliged to have paid their registration fees before December 31, 1997.

Address of the Congress Secretariat:

XVI World Congress of Soil Science
Agropolis – Avenue Agropolis – 34394 Montpellier Cedex 5
France
tel: (+33)67 04 75 38; fax: (+33)67 04 75 49

A l'invitation de
l'AFES, Association Française pour l'Etude du Sol

LE 16ème CONGRÈS MONDIAL DE SCIENCE DU SOL

aura lieu à

MONTPELLIER

(France)

du 20 au 26 août 1998

Le thème général retenu pour le congrès est le suivant:

Fonctionnement actuel des systèmes pédologiques mondiaux en relation avec les divers types d'utilisation des sols par les sociétés humaines

Le congrès se déroulera au **Corum,** Palais des Congrès de Montpellier. Il sera structuré autour de:

- 5 conférences introductives
- 45 symposiums
- des sessions de communications affichées (posters)
- des sessions de travail pour les Commissions, Sous-commissions, Groupes de travail et Comités permanents de l'AISS
- des expositions scientifiques et techniques
- des excursions scientifiques dans la région de Montpellier.

Le congrès sera précédé et suivi de plusieurs excursions scientifiques. Ces excursions, qui dureront chacune une semaine, auront lieu:

- dans diverses régions de France
- dans des pays européens voisins de la France
- dans des pays d'Afrique du Nord
- dans des pays d'Afrique tropicale

La première annonce détaillée du programme du congrès, avec bulletin de pré-inscription pour les participants, sera diffusée dans le bulletin de l'AISS no 88 (1995/2), qui paraîtra à l'automne 1995.

Le programme définitif du congrès sera arrêté par le Conseil de l'AISS, lors de sa réunion à Montpellier, du 9 au 12 avril 1996. Ce programme sera immédiatement largement diffusé à tous les membres de l'AISS, à toutes les Associations Nationales de Science du Sol, à toutes les Unions Scientifiques membres du Conseil International des Unions Scientifiques (ICSU), à toutes les institutions scientifiques et techniques et à toutes les entreprises concernées par les sols.

Les propositions de communications (pour les symposiums et pour les posters), sous la forme d'un résumé d'une page, seront à envoyer au Comité d'Organisation du congrès avant le **30 avril 1997.** Un travail de sélection des communications sera effectué par le Comité Scientifique du congrès, en relation avec les animateurs des symposiums. Les textes complets des communications retenues devront être fournis par les auteurs avant le **31 décembre 1997.**

Les droits d'inscription au congrès, pour ceux qui s'inscriront avant le 31 décembre 1997, seront de l'ordre de 2000 francs français par personne (environ 380 $ US, au taux actuel du change). Pour ceux qui s'inscriront après le 31 décembre 1997, les droits d'inscription seront majorés de 20 %. Un tarif réduit sera accordé aux étudiants. Les auteurs de communications devront obligatoirement payer leurs droits d'inscription avant le 31 décembre 1997.

Adresse du Secrétariat du Congrès:

16ème Congrès Mondial de Science du Sol
Agropolis – Avenue Agropolis – 34394 Montpellier Cedex 5 – France
Tél: (33)67 04 75 38 – Fax: (33) 67 04 75 49

Die Französische Bodenkundliche Gesellschaft (AFES) lädt ein:

XVI. BODENKUNDLICHER WELTKONGRESS
in Montpellier (Frankreich)

vom 20.- 26. August 1998

Der Kongreß findet im **Corum,** Palais des Congrès, in Montpellier statt. Das Generalthema des Kongresses lautet:

„Derzeitige Funktionen weltweiter bodenkundlicher Systeme in Abhängigkeit unterschiedlicher Bodennutzungsformen durch die menschliche Gesellschaft"

Der Kongreß wird bestehen aus:

- 5 Einführungsvorträgen
- 45 Symposien
- Posterausstellungen
- Arbeitssitzungen der Kommissionen, Subkommissionen, Arbeitsgruppen und Komitees der IBG
- wissenschaftlichen und technischen Ausstellungen
- wissenschaftlichen Exkursionen in der Region von Montpellier

Vor und nach dem Kongreß werden mehrere wissenschaftliche Exkursionen durchgeführt. Jede dieser Exkursionen dauert 1 Woche und führt:

- in verschiedene Regionen Frankreichs
- in benachbarte europäische Länder
- in nordafrikanische Länder
- in Länder des tropischen Afrika

Die erste detaillierte Ankündigung des Kongreßprogrammes mit Formularen für eine vorläufige Registrierung der Teilnehmer wird mit dem Mitteilungsblatt der IBG Nr. 88 1995/2, das im Herbst 1995 erscheinen wird, veröffentlicht.

Das endgültige Kongreßprogramm wird durch den Beirat der IBG anläßlich einer Sitzung in Montpellier vom 9.–12. April 1996 festgelegt. Dieses Programm wird unmittelbar danach an alle Mitglieder der IBG, an alle nationalen Gesellschaften für Bodenkunde, an alle Mitglieder der internationalen wissenschaftlichen Vereinigung des International Council of Scientific Unions (ICSU), an alle wissenschaftlichen und technischen und an alle weiteren Institutionen, die sich mit Böden beschäftigen, verteilt werden.

Einreichung von Vorträgen (für die Symposien oder für die Posterausstellung) in Form einer Zusammenfassung von einer Seite, müssen dem Organisationskomitee des Kongresses vor dem 30. April 1997 zugesandt werden. Die Auswahl und Zuordnung der Vorträge wird durch das wissenschaftliche Komitee des Kongresses in enger Zusammenarbeit mit den Vorsitzenden der Symposien durchgeführt werden. Die vollständigen Texte der angenommenen Vorträge müssen von den Autoren vor dem 31. Dezember 1997 eingereicht werden.

Die Einschreibgebühren für den Kongreß für diejengen, die sich vor dem 31. Dezember 1997 einschreiben, wird ungefähr 2000 FF pro Person (derzeit ca. 380 US$) betragen. Diejenigen, die sich nach dem 31. Dezember 1997 einschreiben, werden eine ca. 20 % höhere Einschreibgebühr bezahlen müssen. Für Studenten besteht eine reduzierte Einschreibgebühr. Autoren von Vorträgen müssen ihre Einschreibgebühr vor dem 31.Dezember 1997 entrichtet haben.

Adresse des Kongreßsekretariats:

XVI. Bodenkundlicher Weltkongreß
Agropolis – Avenue Agropolis – 34394 Montpellier Cedex 5
Frankreich
Tel: (+33)67 04 75 38; Fax: (+33)67 04 75 49

POSTSCRIPTUM TO THE XVth WORLD SOILS CONGRESS IN ACAPULCO

REPORT OF THE AD-HOC WORKING GROUP FOR POSTER EVALUATION AND ANALYSIS

(see report in ISSS Bulletin 86, pp 21–25)

This is the list of the best posters that were selected at the poster sessions of the Acapulco Congress:

Commission I
G.N. Magesan, D.R. Scotter, B.E. Clothier, R.W. Tillmann (New Zealand)

Movement of cations through unsaturated soil

Commission II
M.A. Rao, L. Gianfreda, A. Violante (Italy)

Catalytic behaviour of acid phosphatases immobilized on clay minerals and organomineral compounds

Commission III
B. VanLauwe, K. Mulongoy, R. Merckx, N. Sanginga (Nigeria)

The fate of added LEUCAENA- and DACTYLADENIA-N in an alley cropping system

Commission IV
R. Poss, J.C. Fardeau, H. Saragoni (France)

K-cycling under maize-cultivation in Togo

Commission V
P. Vijarnsorn, L. Moncharoen, T. Vearaslip, H. Eswaran (Thailand)

The 1994 Soil Map of Thailand

Commission VI
Y. Chavez-Huerte, G. Carmona-Carranza (Mexico)

La erosion hidrica asociada a los incendios forestales

Commission VII
J. Cotter-Howells (United Kingdom)

Heavy metal phosphate formation in soils

K.H. Hartge, Germany

TO A SOIL MONOLITH

(pedology - is that all there was to it?)

... And that man from the Ministry
That pedological go-and-get-it,
He'll measure you in your pit and take a likeness of you
With Kodachrome or possibly
Munsell-chip you.

The labmen will then get you
with thin sections vet you
Surmising what's your age.
In jars they'll particle-size you
Endeavouring to analyse you
Since that's now all the rage.

Then when you're tabulated
Recorded and debated
And properly written down,
They'll put you in a case
In that Museum place
In Wageningen town.

(Adapted and translated by Alex McBratney
from the Scots poem 'Sic Transit Gloria Mundi'
by J. K. Annand.)

ANNOUNCEMENT

INTERNATIONAL SYMPOSIUM ON SALT-AFFECTED LAGOON ECOSYSTEMS
ISSALE-95

Valencia, Spain, September 18 – 25, 1995
Official Intercongress Meeting of Subcommission A, ISSS (Salt Affected Soils)

NOTICE OF INTENT:

I intend to participate in the International Symposium on Salt-Affected Lagoon Ecosystems to be held in Valencia (SPAIN) on September 18-25, 1995

Name .....

Institution .....

.....

Postal address .....

.....

.....

Phone .....

Fax .....

E-mail .....

I intend to submit a paper entitled:

.....

.....

I will participate in the Post-Symposium Excursion Yes / No

Please return this form as soon as possible to:

Prof. Dr. Jorge Batlle-Sales
Departamento de Biología Vegetal, Facultad de Farmacia
Universitat de València
Avda. Vicent Andrés Estellés
46100 Burjasot, Valencia – **SPAIN**

Phone: +34-6-3864-289 E-mail: jorge.batlle@uv.es
Fax: +34-6-3864-926 and +34-6-3864-289

ISSS-AISS-IBG

Notice of Intent/Registration Form

Note d'Intérêt/Fiche d'Inscription

Absichtserklärung/Anmeldeformular

To: Organizing Committee of

.....

.....

.....

From: Name and title

.....

full address: .....

.....

.....

telephone: fax:

Dear Madam, Sir,

○ I intend to participate in the conference, meeting, seminar, workshop* mentioned above. Please send me detailed information.

○ I intend to present a paper/poster*, entitled:

.....

Comments:

○ I register for participation in the conference, meeting, seminar, workshop*, mentioned above.

Comments:

Date: Signature:

---

*) please delete if not applicable

HAVE YOU ALREADY PAID YOUR ISSS MEMBERSHIP FEE FOR 1995?

For your information: on your address label (first line) you will find your membership number:

xxx-yyyyy 1995 – I or **L**

xxx three-digit country code which generally indicates the country of residence of the member or the national society to which the member is affiliated.

yyyyy five-digit current registration number of the ISSS

year I or L: indicates the year, for which the last contribution was paid

95–I individual payment for 1995 by the member directly to ISSS

95–L payment for 1995 through the national society

ISSS membership fee:

12 US$ per year, if paid directly to account no. 817338.61T (account in US$) at the Schweizerische Bankgesellschaft (SBG), CH-8903 Birmensdorf, Switzerland

Payment by **cheque to the address of the Treasurer:**

17 US$, as the bank fees amount to 5 US$

Dr. Peter U. Lüscher
WSL, Zürcherstrasse 111
CH-8903 Birmensdorf, Switzerland
phone: (41)-1-739-2299, fax: (41)-1-739-2215

Reduced fee for an **advance payment** of **four** years:

44 US$ (cheque: 49 US$)

For outstanding membership fees (before 1994) reminders are being sent out. We would kindly ask all members who have not yet paid their membership fees to balance their accounts as soon as possible.

Dr. P.U. Lüscher, Treasurer

AVEZ-VOUS AVEZ DÉJÀ PAYÉ VOTRE COTISATION ANNUELLE DE L'AISS POUR 1995?

Pour vous permettre de contrôler: sur votre étiquette d'adresse figurant sur l'enveloppe du bulletin, vous trouverez votre numéro d'enregistrement:

xxx-yyyyy ***1995–I*** ou ***L***

xxx code du pays (trois chiffres), indiquant en général le pays de résidence ou l'association nationale, à laquelle le membre est affilié.

yyyyy code d'enregistrement interne à l'AISS (cinq chiffres)

année-I ou L: l'année du dernier paiement

95–I pour 1995, cotisation payée individuellement, c'est à dire directement à l'AISS par le membre à l'AISS

95–L pour 1995 cotisation payée par l'association nationale

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compte n° 817338.61T (compte en US$) Schweizerische Bankgesellschaft (SBG), CH-8903 Birmensdorf, Schweiz

Si vous envoyez un **chèque à l'adresse du trésorier,** veuillez SVP ajouter 5 US$ s.v.p. pour couvrir les dépenses supplémentaires, soit **au total 17 US$**

Dr. Peter U. Lüscher
WSL, Zürcherstrasse 111
CH-8903 Birmensdorf, Suisse
tél: (41)-1-739-2299, fax: (41)-1-739-2215

Si vous payez pour quatre ans à l'avance, une réduction de cotisation sera accordée:

44 US$ (par chèque: 49 US$)

Pour les cotisations annuelles antérieures à 1994 qui ne sont toujours pas payées nous envoyons un rappel. Nous demandons à tous les membres qui n'ont pas payé leurs cotisations annuelles de les régler dans les meilleurs délais.

Peter Lüscher, Trésorier

HABEN SIE IHREN IBG MITGLIEDERBEITRAG 1995 BEREITS BEZAHLT?

Zur Kontrolle: Auf der Adressetikette (oberer Rand) steht Ihre Mitgliedernummer:

xxx-yyyyy 1995 – I oder **L**

xxx	entspricht einem dreistelligen Ländercode und bezeichnet in der Regel das Land, in dem das Mitglied der nationalen Gesellschaft angehört bzw. in den meisten Fällen auch wohnt
yyyyy	entspricht einer laufenden fünfstelligen Nummer in unserer Registratur
Jahr I oder L:	gibt das Jahr an, für das der letzte Beitrag bezahlt wurde
95–I	individuelle Zahlung für 1995 vom Mitglied direkt an die IBG-Kasse
95–L	Zahlung für 1995 über die nationale Gesellschaft

IBG-Beiträge:

pro Jahr 12 US$, bei Direktzahlung auf das Konto No. 817338.61T (Kto. in US$) Schweizerische Bankgesellschaft (SBG), CH-8903 Birmensdorf, Schweiz

Zahlungen mit **Scheck an die Adresse des Schatzmeisters:**

17 US$, da Bankspesen 5 US$

Dr. Peter U. Lüscher
WSL, Zürcherstrasse 111
CH-8903 Birmensdorf, Schweiz
Tel: (41)-1-739-2299, Fax: (41)-1-739-2215

Ermäßigung bei **Vorauszahlung** für vier Jahre:

44 US$ (Scheck: 49 US$)

Für ausstehende Mitgliederbeiträge (< 1994) werden zur Zeit Mahnungen versandt. Wir bitten alle Mitglieder mit Zahlungsrückständen, diese möglichst umgehend zu begleichen.

Peter Lüscher, Schatzmeister

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of
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Secretary: Dr. J. Kühle, ITEC GmbH, Grimlinghauser Str. 21, 40221 Düsseldorf, Germany
and
Y. Frenot, Station Biologique de Paimpont, 35380 Paimpont, France.

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ISSS INTERCONGRESS MEETINGS 1994 - 1998

(see also section "Meetings, Conferences, Symposia" in this Bulletin)

1995

RESOURCE MANAGEMENT DOMAINS
Malaysia
(Sub-Commission F, Working Groups PD, SP)

3rd INTERNATIONAL CONFERENCE ON THE BIOGEOCHEMISTRY OF TRACE ELEMENTS
Paris, France
(Sub-Commission G)

THIRD INTERNATIONAL MEETING ON RED MEDITERRANEAN SOILS
Chalkidiki, Greece,
(Commission V)

THE SCIENCE OF COMPOSTING
Bologna, Italy
(Working Group FA)

ORGANIC MINERAL INTERACTIONS IN SOILS AND SEDIMENTS
Newcastle upon Tyne, U.K.
(BSSS, Mineralogical Society, IHSS)

RECONSTRUCTION AND CLIMATIC IMPLICATIONS OF QUATERNARY PALEOSOLS AND PALEOSOLS SEQUENCES at the XIV CONGRESS OF THE INTERNATIONAL UNION FOR QUATERNARY RESEARCH
Berlin, Germany
(Working Group PP; with INQUA)

IHSS INTERNATIONAL CONFERENCE ON "THE NEW FRONTIER OF HUMIC SUBSTANCES' STUDIES"
Atlanta, Georgia, U.S.A.
(Commission II)

SALT-AFFECTED LAGOON ECOSYSTEMS
Valencia, Spain
(Sub-Commission A)

PRESENT-DAY AND FUTURE GOALS OF SOIL SCIENCE AS A BASIC EARTH SCIENCE
Moscow, Russia
(Commission V)

III LATIN AMERICAN WORKSHOP ON CONSERVATION TILLAGE
San Jose, Costa Rica
(Sub-Commission C, Latin American Network on Conservation Tillage, RELACO)

SOIL CHEMISTRY AND ECOSYSTEM HEALTH
St. Louis, Missouri, U.S.A.
(Working Group MO, with Division S-2,
Soil Science Society of America)

3rd CONFERENCE ON FOREST SOILS – SOILS OF TROPICAL FOREST ECOSYSTEMS
Balikpapan, Indonesia
(Sub-Commission E)

SOIL DEGRADATION, SOCIETY AND GLOBAL CHANGE
Nagpur/New Delhi/Hyderabad, India
(Commissions V and VI)

1996

RECYCLING IN SOIL OF RESIDUES FROM OLIVE OIL PRODUCTION
Lecce, Italy
(Working Group FA)

SOIL AND WATER QUALITY AT DIFFERENT SCALES
Wageningen, The Netherlands
(WG-MV, WG-PM, WG-SP)

TEN YEARS TERRESTRIAL RADIOECOLOGICAL RESEARCH FOLLOWING THE CHERNOBYL ACCIDENT
Vienna, Austria
(Austrian Society of Soil Science, Comm II)

INTERNATIONAL WORKSHOP ON SOIL EROSION AND SUSTAINABLE MANAGEMENT OF STEEP LANDS
Kunming, China
(Sub-Commission C, with the World Association on
Soil and Water Conservation (WASWC)

SOIL STRUCTURE – PHYSICAL PROCESSES AND FUNCTIONS IN ECOSYSTEMS
Kiel, Germany
(Commission I)

LATIN AMERICAN SOIL SCIENCE CONGRESS
Piracicaba, Brazil

10th INTERNATIONAL WORKING MEETING ON SOIL MICROMORPHOLOGY
Moscow, Russia
(Sub-Commission B)

INTERNATIONAL SOIL ZOOLOGY COLLOQUIUM
Dublin, Ireland
(Sub-Commission D)

IMPACT OF MINERALS-ORGANICS-MICROBES – INTERACTIONS ON SOIL AND FRESHWATER ENVIRONMENTS
Nancy, France
(Working Group MO)

RHIZOSPHERE ACTIVITY AND ITS MANAGEMENT
Havana, Cuba
(Working Group RZ, with Commissions III and IV)

LAND EVALUATION FOR SUSTAINABLE MANAGEMENT
Enschede, Netherlands

with satellite workshop:

8th IHSS INTERNATIONAL MEETING
Wroclaw, Poland
(joint ISSS)

SOILS WITH GYPSUM
Lleida, Spain
(Spanish Society of Soil Science, Commission V)

SOIL RESILIENCE AND SUSTAINABLE LAND USE FOR SMALL-HOLDINGS
Dhaka, Bangladesh
(Commission IV)

1997

EDUCATION IN SOIL SCIENCE
France
(Committee on Education in Soil Science)

ANTHROPOGENIC PEDOGENESIS
Russia
(Commission V)

EVALUATION OF SUSTAINABLE LAND MANAGEMENT: CASE STUDIES
Zimbabwe
(Sub-Commission F, Working Groups PD, SP)

MEETING OF THE ASSOCIATION INTERNATIONALE POUR L'ETUDE DES ARGILES (AIPEA)
Ottawa, Canada
(AIPEA, with ISSS Commission VII)

AGRO-ECOLOGICAL AND ECONOMICAL ASPECTS OF SOIL TILLAGE – 14th ISTRO CONFERENCE
Lublin - Pulawy, Poland
(ISTRO, with Commission VI)

6th INTERNATIONAL CONFERENCE ON AGROPHYSICS
Lublin, Poland
(Institute of Agrophysics, Lublin, with Commission I)

ENVIRONMENTAL BIOGEOCHEMISTRY SYMPOSIUM
(Italy/Cuba)
(Subcommission II)

1998

INTERNATIONAL SYMPOSIUM ON EARTHWORM ECOLOGY
Salamanca, Spain
(Sub-Commission D)

TASK FORCE ON SOIL HORIZONS

15th Meeting of the International Society of Soil Science
Acapulco, Mexico, July 10 – 16, 1994

The main objective of the Task Force on Soil Horizons at this meeting was to present the progress that was made since its creation at the previous meeting in Kyoto, Japan in 1990. The presentation was made in the form of 11 posters that were displayed in a booth that was lent by the organizing committee. The list of posters is given below. As you see from this list, each poster was contributed by a specialist on a specific aspect.

Soil horizon booth

The booth attracted much attention and there was a constant flow of visitors. Of particular interest were the visits of the younger soil scientists and their eagerness to help in the future. I am very happy with the outcome and can now proceed with confidence especially as I will have the help and cooperation of Professor McBratney from the University of Sydney. His contribution in the area of Fuzzy Set Theory and general statistics will be of fundamental importance.

Introduction to the Posters

This collection of posters brought together some of the divergent concepts that have been developed about soil horizons.

No. 1 "History of Soil Horizons" by E.M. Bridges gave a brief history of the development of the ideas about soil horizons.

No. 2 "Coordinate Diagram for Saline Horizons" by J.Y. Loyer illustrated the most recent approach to the creation of soil horizons using coordinate principles. Here the application was to saline horizons but it can be applied to most if not all types of horizons.

No. 3 "Référentiel Pédologique" by D. Baize summarized this new type of French classification which uses the concept of reference horizons.

No. 4 "Application of continuous methods of soil classification and land suitability assessment in the lower Naomi Valley" by J. Triantafilis and A.B. McBratney demonstrated some of the problems in old landscapes where layering has proceeded for a long period. The presence of layering is probably more widespread than generally recognized.

No. 5 "Principles for soil horizons" by E.A. FitzPatrick gave the stage that has been reached by the Task Force on Soil Horizons where an attempt has been made to establish principles that apply to soil horizons.

No. 6 "Practical Classification of Topsoils" by M. Purnell presented the recent work by FAO categorizing the full range of surface horizons including those of anthropic origin.

No. 7 "Redoximorphic soil horizons" by H.-P. Blume was an attempt to establish criteria for differentiating types of gley horizons. Most systems of soil classification do not recognize gley horizons.

No. 8 "An Acid Sulphate Identikit" by D.Dent was an attempt to produce a system for recognizing acid sulphate soils in the field.

No. 9 "Horizons with Gypsum" by R.M. Poch and E.A. FitzPatrick gave the recent developments in the recognition of horizons containing gypsum and the need for further horizons to cover the range of variability.

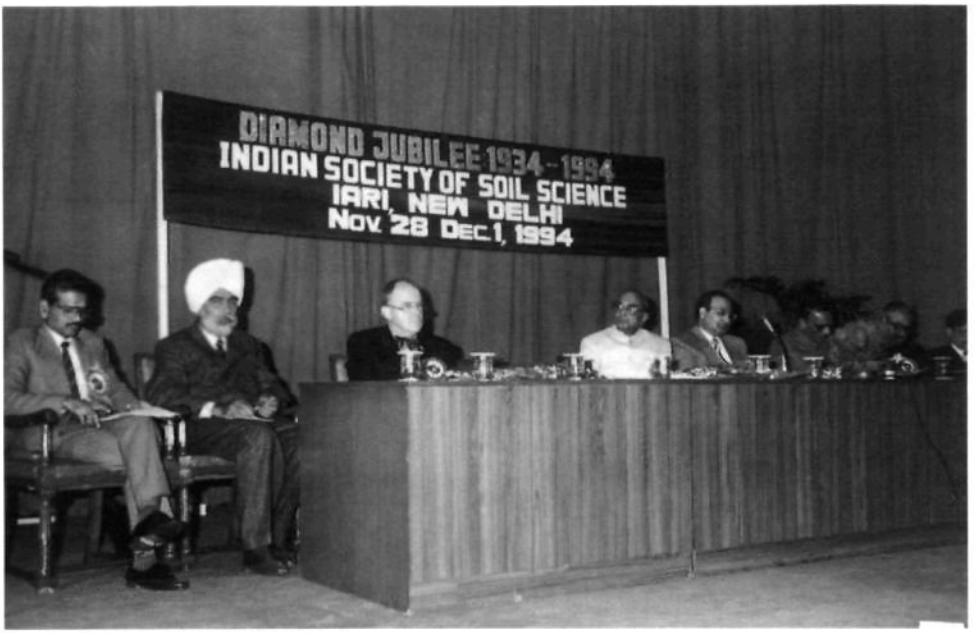
No. 10 "Stone-Layer Soil Features" by B.K. Johnson. Stone lines and gravel layers are virtually ignored in most classifications. This poster presented recent work in this area.

No. 11 "Desert Surface Horizons" by A. Souirji. The surface horizons of desert soils have been very much neglected. This poster discussed these unique horizons.

Diamond Jubilee Symposium of the Indian Society of Soil Science, New Delhi, India, November 28 – December 1, 1994

The Diamond Jubilee Symposium of the Indian Society of Soil Science was held during November 28 – December 1, 1994 at the Indian Agricultural Research Institute in New Delhi, India. It focused on the management of land and water resources for sustainable agriculture and environment. It was inaugurated by Dr. Jayant Patil, Member, Planning Commission, Government of India. The opening address was given by Dr. R.S. Paroda, Secretary, government of India and Director General, Indian Council of Agricultural Research. Dr. I.P. Abrol, Deputy Director General, Indian Council of Agricultural Research, Dr. N.N. Goswami, President, Indian Society of Soil Science, and Dr. G. Narayanasamy, Honorary Secretary, Indian Society of Soil Science welcomed the more than 500 soil scientists from India and other countries (Austria, Canada, Hong Kong, The People's Republic of China, and the USA). Drs. J.S. Kanwar, D.R. Bhumbla, T.D. Biswas, N.S. Randhawa, G.S. Sekhon, S.S. Khanna, and I.P. Abrol, past presidents, gave presentations on their experiences as leaders of the Indian Society of Soil Science.

The program consisted of 16 invited papers in five sessions. The keynote address was given by Dr. J.S. Kanwar, past president of the International Society of Soil Science and the Indian Society of Soil Science. In his thought-provoking presentation, Dr. W.E.H. Blum, Secretary-General, International Society of Soil Science, discussed the constraints in the management of land and water resources and the protection of the environment on a strategic, technical, and operational level. Dr. S.K. Sinha, Director, Indian Agricultural Research Institute, emphasized the importance of the soil factor in methane emissions from rice-paddies. My presentation dealt with the soil and plant analysis for agricultural and environmental research in Canada. Other Indian and foreign speakers covered different facets of management of soil and water resources. The 21st Dr. R.V. Tamhane Memorial Lecture was presented by Dr. S.M. Virmani on the UNCED Agenda 21. The 12th Prof. J.N. Mukherjee-Indian Society of Soil Science Foundation Lecture by Dr. U.S. Sreeramulu dealt with the utilization of sewage and sludge for increasing crop production. At the National Seminar on "Developments in Soil Sci-



Inaugural function (left to right): Dr. G. Narayanasamy, Secretary; Dr. Bhajan Singh, Vice-President; Prof. W.E.H. Blum, Secretary-General, ISSS; Dr. Jayant Patil, Member of Planning Commission, Government of India; Dr. R.S. Paroda Director General, Indian Council of Agricultural Research; Dr. S.K. Sinha, Dr. I.P. Abrol, Dr. P.K. Chhonkar.

Prof. W.E.H. Blum receiving a memento from Dr. Bhajan Singh

Some of the Symposium participants

ence", a total of 294 voluntary papers were presented in four sessions. This consisted of 206 oral and 88 poster papers. The number of oral papers on soil physics, soil chemistry, soil biology, soil fertility and plant nutrition, soil genesis and classification, soil technology, and soil mineralogy were 33, 41, 10, 79, 8, 32, and 3, respectively. The corresponding figures for poster papers were 13, 20, 3, 39, 3, 10, and 0, respectively.

The proceedings of the invited papers and the extended summaries of the voluntary papers were made available to the delegates at the time of registration. A cultural program on the evening of November 29 included dances, songs, and music from different regions of India. The 59th Annual General Meeting of the Society was held on November 30 and it was addressed by Dr. N.N. Goswami, President of the Society.

With a modest beginning in 1934, the Society has grown into a professional organization enjoying international recognition. It deserves congratulations on its many accomplishments. Two notable examples are the International Symposium on Soil Fertility Evaluation, February 9-14, 1971 (500 delegates representing 27 countries) and the International Congress of Soil Science, February 8–16, 1982 (1115 delegates from 70 countries); both held in New Delhi. I have pleasant memories of both of them. The Society has 37 chapters throughout the country. It has about 2200 members including over 400 life members. Further information on the Society can be obtained by contacting Dr. G. Narayanasamy, Honorary Secretary, Indian Society of Soil Science, Division of Soil Science and Agricultural Chemistry, Indian Agricultural Research Institute, New Delhi – 110 012, India.

Although I have been a life member of the Society for over 12 years, this was the first annual conference that I attended. I was impressed by the calibre of papers presented and the excellent arrangements made by the organizing committee. The staff at the registration desk was very knowledgeable and helpful. I am grateful to Dr. Goswami for inviting me to present a paper at this very important symposium. Personally for me it was an excellent visit. I met a number of friends whom I had not seen for many years. I even met a classmate (Dr. S.K. Tripathi) with whom I did my B.Sc.(Ag.) in 1961 at the Government Agricultural College, Kanpur. The high calibre of papers, cultural program, superb cuisine, and the unparalleled Indian hospitality made it an event that will shine like a diamond for many years to come.

Y.P. Kalra, Canada

Jubilee Meeting on the occasion of the 90th Anniversary of V. A. Kovda's Birth

Pushchino-Oka 17–18 January 1995

The Institute of Soil Science and Photosynthesis of the Russian Academy of Sciences organized a jubilee meeting in Pushchino-Oka (Russia) devoted to the 90th anniversary of its founder, Prof. V. A. Kovda (1904–1991), one of the most important representatives of 20th century soil science.

The Russian Academy of Sciences and its department in Pushchino, the Russian Soil Science Society, the Faculty of Soil Science of the Moscow State University Lomonosov, and the Dokuchaev Soil Institute, Moscow, also participated in the organization of the conference.

On January 17, 1995, after the opening address of the Institute's director, Prof. G. V. Dobrovolsky of the Moscow University, and the President of the Russian Soil Science Society, who chaired the meeting, delivered his introductory paper on the activities and importance of Professor Kovda in research, teaching and organization. He underlined the historical role of Professor Kovda, who was a worthy successor of Dokuchaev and Glinka and an eminent scientist on the same level, playing a leading role in Russian and international soil science. As a close co-worker of Kovda, Professor Dobrovolsky remembered their joint activity at the foundation of the Faculty of Soil Science of Moscow University.

Professor V. N. Kudeyarov, who was deputy director of the Pushchino Institute under the directorship of Professor Kovda for many years, presented a paper on the history and achievements of the late Professor in different places over the years. He particularly stressed his role as creator of the Institute in Pushchino, and as organizer and teacher, founding not only a new institution but also elaborating new approaches in Soviet and international soil science.

Prof. Dr. W. E. H. Blum, Secretary-General of the International Society of Soil Science spoke with warm feeling of the activities of Professor Kovda in connection with ISSS, which has developed significantly in the last years. He spoke of how happy Professor Kovda would be, seeing the results of the efforts that he had undertaken for decades, laying the foundations for a success to which he contributed a lion's share in many functions, particularly as President of the ISSS, between 1968 and 1974.

Prof. I. Szabolcs delivered his paper on Professor Kovda as an outstanding person in the history of soil science, who created an epoch in this field as eminent successor of the previous two generations of leading international soil scientists. He underlined the capability of V. A. Kovda to contact and lead different professional circles both at home and abroad. He also recalled his warm human qualities besides his fantastic scientific vision and working capacity.

V. D. Vasilevskaya, who is the successor of Professor Kovda to the chair of Soil Science at the Moscow State University Lomonosov, remembered him as Professor of the Moscow State University and creator of scientific conceptions at the Faculty of Soil Science, with particular interest in soil bio-geo-chemistry which is a traditional approach in Russian soil science, already dealt with by Professor Kovda's predecessors, Vernadsky and Polinov.

Professor V. Targulian, Chairman of Commission V (Soil Genesis, Classification and Cartography) of ISSS, presented his paper entitled "Concept of the pedosphere as an open biosphere system", in which he linked new achievements in the field of modern theoretical science with the works of Kovda. He stressed that the interrelation of soil science and biosphere in modern research was initiated by Professor V. A. Kovda.

Dr. Albert V. Baez, California, USA, in his memorial presentation recalled the years he worked with Kovda in Paris in the early 60s when the latter was Director of the Department of Natural Sciences at the UNESCO.

Prof. B. A. Zimovec from the Dokuchaev Soil Institute remembered Professor Kovda in his presentation as the initiator of the soil amelioration theory and practice with particular regard to the former Soviet Republics. He stressed that the agroecological principles of soil amelioration were elaborated by Prof. V. A. Kovda.

L. A. Gugalinskaya presented a paper entitled "V.A. Kovda's Conceptions of Paleo-hydromorphism in Soil". In this interesting paper the author characterized the modern aspects of the subject as well as Professor Kovda's role as initiator of research into it.

After the invited speakers, V. A. Kovda's former colleagues remembered him biefly as scientist, leader, professor and warmhearted man.

Nearly all of the speakers recalled that his family, of which his widow, Alexandra, and his younger daughter, Irina, with her husband and baby, also attended the meeting, always stood by him and assisted him, providing a comfortable atmosphere to work in.

Parallel to the conference, an exhibition was organized on Professor Kovda's life, activities and achievements. The exhibition was very rich in photographs, publications and other objects related to his life and work.

Professor Kovda, who lived to be 87 years and was exceptional both in national and international soil science, left an unforgettable heritage in the history of his science and the conference of Pushchino was a proper tribute to his memory.

On January 18, the participants of the memorial conference visited the Institute of Soil Science and Photosynthesis in Pushchino and its very interesting Museum of Natural Sciences and Contemporary Political History. The latter was founded by Professor V. I. Kefeli, Director of the Institute and one of the chief organizers of the meeting, who, however, was on a study tour abroad at the time and could only address the Jubilee Meeting by cable.

I. Szabolcs, Budapest

THE SOIL MICROMORPHOLOGY IN ARCHAEOLOGY WORKING GROUP

This informal working group was set up in 1990, through a first workshop organized by R. I. Macphail at the London Institute of Archaeology. This first meeting pointed out the need for links and contacts between European soil micromorphologists working in archaeology.

The aim

Interpretation of soil micromorphology thin section requires long experience and the access to a wide reference data base. Practically, this reference base is very difficult and expensive to organize as a unique collection for consultation. Instead, site material and reference material can be brought to workshops by different scientists.

The working group is a link between researchers who want to share and broaden their experience. Twice a year, through workshop sessions, researchers can have access to a wide variety of thin sections brought by colleagues.

Activities:

- Researchers Data Base
  A list of the researchers is updated every year, with research topics, current sites, publications, etc.

- Workshops
  Twice a year, workshops (one in the UK, one on the continent) are organised for presentations of research, group discussion, and proposition for new research and collaboration.

Most of the time, usually 2-3 days, is used for discussion about thin sections within mircoscope sessions. The workshop sessions also give the opportunity to have a "pre-reviewing" check and discussions of thin sections with referees from geo-archaeology, quaternary research, ...

- Soil Micromorphology Archaeological Data Base
  This data base is being organised by C. French (Cambridge) in the form of a reference list of thin sections (name of the owner, etc.)

If you would like to join us for the **next workshop in DIJON (France), in July or September 1995, please contact:**

Dominique Sordoillet,
Centre des Sciences de la Terre, Université de Bourgogne,
6-Boulevard Gabriel, 21000 Dijon (France)

For more information, please contact:

Richard I. Macphail,
Institute of Archaeology, University of London
31-34 Gordon Square, London WC1 H0PY, U.K.

or

Anne Gebhardt,
Laboratoire d'anthropologie, Université de Rennes 1
Campus de Beaulieu, 35042 Rennes Cedex, FRANCE

Anne Gebhardt, France

REPORTS OF MEETINGS
CCOMPTE-RENDUS DE REUNIONS
TAGUNGSBERICHTE

FAO/IAEA International Symposium on Nuclear and Related Techniques in Soil/ Plant Studies on Sustainable Agriculture and Environmental Preservation.

Vienna, Austria, October 17–21, 1994

This symposium, which was attended by over one hundred participants from forty-three countries and by FAO and International Society of Soil Science high ranking officials and other famous soil scientists from different organizations, was successfully completed in Vienna, last October. There were forty oral presentations and thirty-one posters which were divided into eight sessions. The sessions included:

i) Recent developments in analytical methods and equipment. In this, there were three presentations on high productivity stable isotope analysis, a GCQMS aided incubation systems for trace gas studies and a system for $^{15}N/^{13}C$ and N/C determination in one sample.

ii) Fertilizer use and management studies. This session included eight papers which highlighted the methods that may be used for efficient management of nutrients using isotope techniques, FAO soil fertility and integrated plant nutrient management programmes, and application of ^{15}N and ^{32}P in fertilizer studies.

iii) Biological nitrogen fixation in sustainable cropping systems. Biological nitrogen fixation – present and future, and the role of biological nitrogen fixation in sustainable agricultural production were the keynote addresses in this session. In addition, papers were also presented on management of legume N_2 fixation in cereal studies and studies of rhizobial ecology using marker genes.

from right to left: Dr. C. Hera, Scientific Secretary, Dr. M. Fried, USA, Dr. B. Sigurbjörnsson, FAO-IAEA Joint Division Chairman, Dr. S. Machi, Deputy Director General, IAEA, Dr. W. Sombroek, FAO, Dr. W.E.H. Blum, ISSS.

iv) Soil organic matter studies and nutrient cycling. The presentations in this session highlighted the recent studies on organic matter turnover with special reference to N and C.

v) Water use and management studies. Papers on the use of neutron probe in soil/plant water studies, and the Tensionic technique for assessment of soil solution inorganic-nitrogen were among those that were presented. A paper on Carbon-13 discrimination as a criterion for identifying high water-use efficiency wheat genotypes under water-deficit conditions presented interesting new findings using this technique under field conditions.

vi) Plant physiological aspects in crop production. Analysis of carbon fluxes in crop environment interactions and the use of radio- and stable isotopes was an invited paper. In addition, there were several papers that dealt with nutrient uptake and partitioning as well as nitrogen nutrition aspects in wheat: legume cropping systems involving lupins.

vii) Environmental pollution and preservation. These papers brought to the attention of the participants the major envrionmental problems caused by irrational agricultural practices. The problems of trace organic chemicals were also discussed.

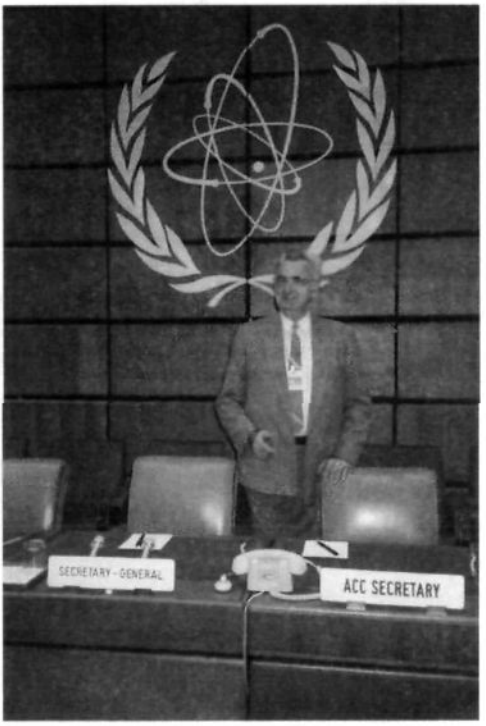
viii) Soil conservation, soil erosion and desertification. The invited paper in this session highlighted the use of fallout radionucleides in soil erosion investigations. Other nuclear methods in soil erosion and siltation were discussed in subsequent papers.

A keynote address on "Aspects of organic matter and nutrient cycling in relation to climate changes and agricultural sustainability" was presented during the opening ceremony.

The objective of this symposium was to assess the progress being made in the use of nuclear and related techniques to study various aspects of soil fertility, plant nutrition, crop production and water use efficiency for sustainable agricultural practices and the environmental problems associated with agriculture and to discuss the potential and limitations of existing methods and the possibilities for further development. All of the oral presentations and posters will be published in the Proceeding of the Symposium.

Further information can be obtained from:

Dr. Christian Hera
Head, Soil Fertility, Irrigation and
Crop Production Section
Joint FAO/IAEA Division
Wagramerstrasse 5, P.O. Box 100
1400 Vienna – Austria
Fax: +43-1-234564



Dr. Christian Hera

International Symposium and Workshop on Desertification in Developed Countries: Why Can't We Control It?

Tucson, Arizona, October 24–29, 1994

On October 24-29, 1994, the United States Bureau of Land Management and Environmental Protection Agency, in collaboration with others, sponsored the "International Symposium and Workshop on Desertification in Developed Countries: Why Can't We Control It?" About 150 scientists and land managers from 15 countries participated in this Symposium and Workshop. More than fifty of the participants were from countries other than the United States, making it truly an "international" symposium and workshop.

During the week, 35 scientific papers were presented orally. These papers concentrated on 1) social, economic, political and institutional factors that have resulted in successful interventions, 2) desertification assessment and systematic observations (monitoring), and 3) techniques that have been tried to halt or reverse desertification processes. Additionally, about 30 poster presentations on the same subjects were displayed during the week.

All papers and posters were of excellent quality. Manuscripts for most of these papers and posters are currently in the peer review and editing process. They will be published in the international journal Environmental Monitoring and Assessment and sent to participants in 1995. They also will be available for purchase from the publisher.

More than 80 participants took advantage of tours offered on Wednesday afternoon and all day Saturday and Sunday. These tours provided opportunities to observe management efforts and research that are underway to improve degraded areas and combat desertification in the southwestern portion of the United States.

On Friday, October 28, six work groups met simultaneously on a variety of issues, taking into consideration what they had learned from the paper and poster sessions earlier in the week.

Central themes emerging from these discussions were 1) the impact of government policy, which has dramatic effects on marginally sustainable areas, 2) the need for scientists to focus on data integration and investigation of cause and effect, and 3) the importance of community involvement and decision making (e.g., a bottom-up approach).

It is our hope that you will consider the recommendations provided herein and share them with others that you think can make a difference in our most difficult task of combatting desertification worldwide.

Further information can be obtained from:

Beaumont C. McClure
Special Assistant to the State Director
for International Programs
Bureau of Land Management
Arizona State Office
3707 N. 7th Street, P.O. Box 16563
Phoenix, Arizona 85011
USA

Fax: (+1)602-650-0398; E-mail: !bmcclure@attmail.com

International Congress on Restoration and Rehabilitation of Degraded Soils in Arid and Semiarid Zones

Tunisia, 13 – 19 November, 1994.

The problem of environmental degradation in arid and semi-arid areas has been of concern since the disastrous droughts which affected the sahel of Africa during the past two decades. This congress, brought together many of the theoretical concepts and practical measures adopted in an attempt to control the degradation of both cultivated lands and pastures in areas of light and unreliable rainfall. The Congress was in two parts, a scientific excursion followed by a formal meeting held in a hotel complex on the Island of Djerba in the south of Tunisia.

The Excursion

The excursion, which was of three days duration, began in Tunis on 13 November, 1994. On registration participants were presented with four very well produced publications: a conference programme and list of participants, an excursion guide, the conference abstracts in French and English and an informative report of the Tunisian Ministry of the Environment. The route of the excursion gave an excellent transect of the country and its landscapes from the "Mediterranean" north to the "Saharan" south.

Areas to the southwest of Tunis in the Miliane and Siliana valleys have a semi-arid climate and are underlain by marls which develop soils very prone to erosion; 71% of the Gouvernorat de Siliana is affected seriously or moderately by erosion. Extension of agriculture onto sloping lands has resulted in great soil losses, completely down to the bare rock in many places. A valiant attempt at Siliana has been made by contour banks and stone terraces to retain soil. This work, funded by the European Commission, has been the subject of a study by Tunisian scientists who had to develop a holistic approach because the problems were not simply concerned with the soil, but also with the social conditions causing the degradation. A hillside viewpoint indicated that soil losses on the lower-lying plains were also severe with colours of subsoil material visible in most fields. To some people this was merely a hydrological problem, rather than a complex soil-vegetation-land use-human problem. Afforestation, using Acacias, Eucalypts and locally growing Pinus halepensis appears to be successful and makes a considerable contribution to "greening" the landscape near the towns of Makthar and Zaghouan.

Further south, at Sadine and Es Sennaga, small dams have been built to impound water in the upper valleys of oueds and this has led to an improvement of water supplies for agriculturalists. The degraded, rocky slopes of the upper oueds make good water harvesting areas for these small dams. However, their life may be short because of siltation. Care had been taken in the design to safely discharge excess water from very heavy rainfall events. These "collinaires", in combination with banks and stone terraces, have greatly changed the formerly arid appearance of the catchment within the command of the irrigation water.

The oases of the arid zone of southern Tunisia have their own unique way of life and their own problems. Restoration and rehabilitation in the Kebili-Douz area was concerned with maintaining the soils and life of the oases. First the excursion participants were shown the salt-encrusted central part of the Chott el Djerid with its polygonal pattern of salt deposits, somewhat degraded by recent inundation. Mobile gypsiferous sand however, was the problem at Debabcha on the eastern margin of Chott el Djerid. The eastern part of the village had been overwhelmed by sand and many buildings abandoned. Extensive fencing on the north and east has been erected to intercept the mobile sand. A geomorphological feature of this village was the presence of cores of old dunes, scoured into fantastic shapes (yardangs) by the wind. At Tombar, a pumping station supplying several oases with water was visited and explanations given about the use of deep well water in the oases. Irrigated date gardens were also visited where delegates were able to sample the "deglat nour" high quality dates produced by the inland oases. Control of water supply and drainage is very important to maintain the salts low in the soil, below the rooting zone.

Overgrazing and the effects of drought resulted in destruction of the vegetation and the silt/fine sand of a Calcic Gypsisol turned from a stable desert steppe into a mobile area of dunes which at times

blocked the main road between Gabes and Gafsa at Menzel Habib. Beginning in 1987, with a budget of 6 million Tunisian dinars, schemes for rehabilitation of this area were put into action. These involved placing lines of fencing to trap the mobile sand together with control of grazing and planting the locally dominant Rhanterium suaveolens and other species able to thrive in this environment. The success of the scheme is such that the revegetation of selected areas has been achieved and there is no longer a problem of sand dunes on the road. Finally, a visit to the Institut des Regions Arides at Medenine gave participants the opportunity to inspect a botanic garden of local desert plants and to hear of the research into tree and palm cultivation, fodder crops and crop protection in the semi-arid areas. Wind erosion experiments and a camel breeding department provided further interest.

The Conference

The opening session was devoted to theoretical studies of ecology and hydrology with no strong reference to the presence of soils, but this omission was rectified later in the programme by several papers which emphasized the dependence of arid and semi-arid ecosystems upon soils. However, with a predominance of ecologists, there was an emphasis on the problems of maintaining pasture ecosystems in these regions. The use of annual nitrogen-fixing legumes was given prominence in that they offered a better chance of survival as seed during drought periods than the perennial plants which suffered badly from both drought and overgrazing. One clear conclusion which emerged was the need for scientists of different disciplines to talk to each other and listen with an open mind.

The conclusions and recommendations of the congress emphasized concern about the degradation of the environment in arid and semiarid areas. As a result of demographic growth, collapse of traditional land use systems in marginal areas has occurred through overgrazing, clearance of natural vegetation and declining fertility. There was an urgent need to control natural resources within the limits of their resilience by a more sympathetic approach to land use management. Once the physical and social systems break down, the cycle of degradation and poverty begins. Many studies have shown that restoration, rehabilitation and improvement of living standards cannot be guaranteed success unless correct holistic policies are adopted and the political will to succeed is present. Technology of all levels may be considered but in the end those suitable for the locality should be used. Although technical knowledge is available, implementation is often difficult and climatic variations do not help. Although, traditional systems have survived for a long time, they may be incapable of meeting the future demands placed upon them and so further research is required.

Despite great efforts by scientists, attempts to restore and rehabilitate degraded areas and introduce water control systems are not always successful, because the co-operation of the local people has not been obtained, nor are the people sufficiently motivated to see the benefits of the proposed changes. Research results need to be effectively transmitted so that the scientists meet the needs of the people they are meant to serve. There must be a combination of theoretical and practical knowledge which the agricultural extension staff can pass on to the farming community to improve their standards of farming and quality of life. Scientific and technical knowledge is often not put into practice because its dissemination is poorly carried out. There must be a greater vision of how such knowledge is to be used for the management of national and international resources on a sustainable basis. The congress provided a valuable forum for the discussion of the available land restoration technology and the means of using it for rehabilitation of degraded areas.

The meeting was closed by the Tunisian Minister of State for Science and Technology who indicated very clearly that the Tunisian Government was determined to grasp the problems arising from degradation of the semiarid and arid lands. Already Tunisia has proved itself to be committed to the task of restoration and rehabilitation of degraded lands, and the Minister appealed for co-operation between the Maghreb countries so that work should proceed in a concerted manner throughout the whole region. A selection of the papers delivered at the congress will be published in Restoration Ecology, published by Blackwell Scientific Publications in the near future.

E.M. Bridges, Wageningen.

International Symposium on New Information Technologies in Agriculture

Bonn, 10-12 November 1993

RECOMMENDATIONS FROM THE SYMPOSIUM

1. Ensure Internet access for the international agricultural community.

2. Commission IAALD, CTA and ZADI to expand a study on information technologies being used by the agricultural information community to include CD-ROM, electronic networks, satellites, etc.

3. Commission a white paper to identify changes in the profession in the next 10 years.

4. Commission a white paper on the state-of-the-art in telecommunications and networking technologies and their availability internationally.

5. That IAALD, CTA, ZADI, and CGIAR support the establishment of a permanent observatory of information technology for the development of a clearing house for the collecting of CD-ROM titles, equipment and related documentation and for their dissemination to developing countries and Eastern Europe.

6. Recognize the need for discussion and thought among the publishers and information officers to devise common solutions to their information production and dissemination problems.

7. Provide scientists with better information on current trends in editing and documentation.

8. Place greater emphasis on agricultural information in electronic publication projects, especially in the developing countries since, up to now, priority has been given to health, basic sciences, and the profitable customers.

9. IAALD should broaden its scope to cover factual as well as bibliographic databases. IAALD should take an active role in coordinating the "subject tree" for agricultural information on the electronic networks.

10. Documentation centres should collaborate with experts in different scientific disciplines in compiling meta-information on non-bibliographic topics.

11. Commission IAALD to draft a model information component for inclusion into agricultural project proposals and planning documents to be submitted to policy and decision makers.

12. Policy makers should be invited to meetings such as the International Symposium on New Information Technologies.

13. IAALD should produce a directory of e-mail addresses on the network.

14. IAALD should broaden its scope to act as an umbrella organization for all professionals involved in agriculture information, that is those who are responsible for disseminating information as well as those who are producing and collating information.

1. Assuer l'accès d'Internet à la communauté agricole internationale.

2. Charger l'IAALD, le CTA et le ZADI d'elargir le cadre de leur étude sur les technologies de l'information exploitées par la communauté travaillant dans le domaine de l'information agricole pour y inclure le CD-ROM, les réseaux électroniques, les satellites, etc.

3. Commander un livre blanc pour identifier les changements à prévoir dans la profession pour les dix prochaines années.

4. Commander un livre blanc sur la situation actuelle des télécommunications et des technologies de réseaux et leur disponibilité au plan international.

5. Charger l'IAALD, le CTA, le ZADI et le CGIAR de soutenier la mise en place d'un centre permanent d'observation en vue de constituer un bureau central pour la collecte de CD-ROM, d'équipe-

ment et de documentation y afférente et pour leur éventuelle diffusion aux pays en développement et aux pays de l'Europe de l'Est.

6. Reconnaître la nécessité d'une concertation entre les éditeurs et les responsables d'information sur les problèmes de production et de diffusion de l'information.

7. Fourir aux chercheurs une meilleure information sur les tendances actuelles dans le domaine de l'edition et de la documentation.

8. Mettre davantage l'accent sur l'information agricole dans les projets de publication électronique plus particulièrement dans les pays en développement où jusqu'à présent la priorité à été mise sur la santé, les sciences fondamentales et les clients rentables.

9. L'IAALD doit éntendre son cadre de bases de données et inclure les bases factuelles ainsi que bibliographiques. Il doit jouer un rôle actif dans la coordination de "l'arbre de matières" pour la formation agricole sur les réseaux électroniques.

10. Les centres de documentation doivent collaborer avec les experts des différentes disciplines scientifiques pour compiler la méta-information sur les matières non-bibliographiques.

11. Charger l'IAALD de rédiger une composante d'information type à inclure dans les propositions des projets agricoles et des documents de planification qui doivent être présentés aux décideurs et planificateurs.

12. Les décideurs doivent être invités aux réunions telles que le Symposium international sur les nouvelles technolgies d'information.

13. L'IAALD doit produire un répertoire d'adresses d'E-mail sur le réseau.

14. L'IAALD doit étendre son domaine d'action pour servir d'organisation parapluie pour tous les professionnels engagés dans le domaine de l'information agricole - les responsables de diffusion, de réalisation ainsi que de production et collecte de l'information.

Abbreviations used:

IAALD	-	International Association of Agricultural Information Specialists
CTA	-	Centre Technique de Coopération Agricole et Rural
ZADI	-	Zentralstelle für Agrardokumentation und -information
CGIAR	-	Consultative Group of International Agricultural Research

NEWS FROM REGIONAL AND NATIONAL SOCIETIES
NOUVELLES DES ASSOCIATIONS REGIONALES ET NATIONALES
BERICHTE VON REGIONALEN UND NATIONALEN GESELLSCHAFTEN

THE 40TH ANNUAL CONFERENCE OF THE CANADIAN SOCIETY OF SOIL SCIENCE

July 10 – 13, 1994

The 40th Annual Conference of the Canadian Society of Soil Science was held in conjunction with the 74th Annual Conference of the Agricultural Institute of Canada in Regina, Saskatchewan, July 10–14, 1994. The theme of the AIC '94 conference, attended by about 750 delegates, was "Changing land tenure – who owns the farm?" On July 11, in the plenary session, Rosemarie Kuptana presented an aboriginal perspective on native land tenure and land stewardship while Jim MacNeill presented the environmental considerations of land tenure changes. The Conference included meetings of the following eight societies: Canadian Consulting Agrologists Association, Canadian Pest Management Society, Canadian Society of Agricultural Engineering, Canadian Society of Agrometeorology, Canadian Agricultural Economics and Farm Management Society, Canadian Society of Agronomy, Canadian Society of Soil Science, Canadian Society of Animal Science, and Canadian Society of Extension. The delegates had an excellent opportunity to broaden their professional networks.

The Canadian Society of Soil Science Conference was held in the historic Hotel Saskatchewan. There were 93 registrants. A total of 56 (36 oral and 20 poster) papers were presented. A. Fedkenheuer, Chair, Awards Committee, presented the following awards at the CSSS Awards Banquet on July 12:

1. Fellows of the CSSS: Melvin Webber and Eeltje de Jong
2. C.F. Bentley Student Oral Presentation Award: M.M. Boehm, W.E. Dubbin, and R.L. Lemke

(From left to right) Dr. Melvin D. Webber and Dr. Eeltje de Jong, recipients of the Fellowship Award, and Dr. K.B. MacDonald, President of the Canadian Society of Soil Science.

The CSSS "Fellows" who participated in the conference in Regina

3. CSSS President's Student Poster Presentation Award: L. Xavier
4. Annual Meeting Student Travel Award: J. Whalen
5. Special Award for Travel to ISSS Congress, Acapulco, Mexico: J. Dumanski, U.C. Gupta, S.S. Malhi and R. Ponce-Hernandez.
6. Short-term Professional Development for International Soil Scientists Award: H. Cuanalo de la Cerda of Mexico

The pre-conference Prairie Farming Systems Tour highlighted prairie farming systems for the dark brown and thin black soil zones of Saskatchewan. The Annual Business Meeting was held on July 13. The CSSS extends special thanks to Paula Brand and Brandon Green of the local Organizing Committee for excellent arrangements.

Y.P. Kalra, Edmonton, Canada

SOCIEDAD COLOMBIANA DE LA CIENCIA DEL SUELO

El VII Congreso de la SCCS se efectuó en la ciudad de Bucaramanga del 5 al 8 de octubre de 1994, donde se presentaron 12 conferencias magistrales sobre el Componente Biorgánico del Suelo. Con una asistencia de 350 delegados, se presentaron 80 trabajos en las diferentes comisiones y 20 posters.

Se eligió nueva Junta Directiva para el período 95-96 en la siguiente forma:

Presidente	:	Rodrigo Lora
Vicepresidente	:	Ricardo Guerrero
Vocales Principales	:	Ricardo Campos, Hugo Montenegro, Fernando Munevar
Vocales Suplentes	:	Alfredo Leon, Daniel Ortega, Alvaro Garcia, Gladys Vallejo, Gloria de Benavides
Revisor Fiscal	:	Leonidas Mejia
Suplente	:	Hugo Castro

Secretario Ejecutivo : Francisco Silva Mojica
Secretaria de Actas : Gabriela Estrada

Dirección de la Sociedad: Carrera 11 No. 66-34 Of.204,
Santafé de Bogotá, Colombia
Telefax: (571) 2113383

CZECH SOIL SCIENCE SOCIETY

The activities of the Czech Soil Science Society have been resumed on the occasion of a foundation meeting held on November 23, 1994. The Committee of the Society consists of:

Dr. J. Kulhavý - Chairperson
Dr. E. Podlešáková - Vice-Chairperson
Ing. E. Pokorný - Secretary

The address is:

Czech Soil Science Society
Dr. J. Kulhavý
Mendel University of Agriculture and Forestry
Institute of Forest Ecology
Zemědělská 3
613 00 Brno
Czech Republic

Tel: (+42-5) 45134179, Fax: (+42-5) 45211422

SOIL SCIENCE SOCIETY OF EAST AFRICA (SSSEA)

The 14th Conference of the SSSEA was held in Mbarara, Uganda from 21–25 November 1994, with the adopted theme "Enhancing farmers efforts to combat soil degradation; A challenge to Soil Science Technology". The conference was attended by scientists, farmers and university students. The Farmers' Session provided a stimulating forum for discussions and understanding of the farmers' problems related to land use, soil and water management.

SSSEA New Office Bearers:

General Chairman		:	Mr. J.N. Quereshi - NARL, KARI, Kenya
Vice Chairman	(i)	:	Dr. J.J.T. Msaky - Sokoine Univ., Tanzania
	(ii)	:	Dr. M.K. Magunda - NARO, Uganda
Secretary General		:	C.K.K. Gachene - Univ. of Nairobi, Kenya
Treasurer General		:	Mrs. A. Muriuki - NARL, Kenya
Country Treasurer	(i)	:	Mr. D.N. Kimaro - NSS, Tanzania
	(ii)	:	Mrs. J.K. Tumuhairwe - Makerere Univ., Uganda

Executive Committee Members:
Prof. P.N.S. Mnkeni, Sokoine Univ., Tanzania
Mrs. S.T. Ikerra, NSS, Tanzania
Dr. J.R. Okalebo, KARI, Kenya
Dr. B. Ikombo, KARI, Kenya
Prof. J.Y.K. Zake, Makerere Univ. Uganda
Mr. C. Nkwiine, Makerere Univ., Uganda

Address: C.K.K. Gachene, Secretary General
c/o Department of Soil Science
University of Nairobi
P.O.Box 30197, Nairobi, KENYA

Tel: 632211, Ext. 27039 or 631643
Fax: (254 2)632121

INDIAN SOCIETY OF SOIL SCIENCE

The Diamond Jubilee of this Society (1934–1994) was held in New Delhi during November 28 – December 1, 1994.

The Office-bearers of the Society for the year 1995 are as follows:

President:	Dr. G. Dev
Vice-Presidents:	Dr. Bhajan Singh and Dr. S.R. Poonia
Secretary:	Dr. G. Narayanasamy
Treasurer:	Dr. R.K. Rattan
Chief Editor:	Dr. T.D. Biswas

Address of the Society:

Honorary Secretary
Indian Society of Soil Science
Division of Soil Sci. & Agric. Chemistry
Indian Agricultural Research Institute
New Delhi - 110012
INDIA

Tel: 91-011-572-0991; Fax: 91-011-574-0722
Telegram: KRISHIPUSA-SOILS

ISRAEL SOCIETY OF SOIL SCIENCE

New Officers:

President:	Prof. Amos Banin
Secretary:	Dr. Rony Wallach
Treasurer:	Dr. Jorge Tarchitzky
Members:	Prof. Yiftah Ben-Asher
	Dr. Asher Bartal
	Dr. Yigal Sallinger

At the time when we received this information (January 1995), a meeting of the Society was planned for February 7, 1995, to discuss the pressing issue of "Soil Resources of Israel and Their Future". The first half-day session was to discuss the scientific aspects of soil-degradation processes in Israel, the second half-day session was to deal with "Forecasts for Competing Future Uses of Soil Resources in Israel".

A keynote lecture was planned to be held by the Minister of Agriculture on "Demands of Agriculture for Soil Resources", other presentations were to include presentations by key officials from the Ministry of the Interior (Urbanization and Highways), Soil Development Authority (Forestation, Open Recreational Lands), Ministry of the Environment (Lands for Waste Disposal).

The address of the Society is:

Prof. Amos Banin
Department of Soil and Water Sciences
The Hebrew University of Jerusalem
P.O.Box 12
Rehovot 76100
ISRAEL

Fax: 972-8-475-181

NEW ZEALAND SOCIETY OF SOIL SCIENCE

New Officers:

President:	L.R. Basher
Vice-President:	P.E.H. Gregg
Secretary:	R.G. McLaren
Treasurer:	I.B. Campbell

Council Members:

M.R. Balks, M.J. Floate, P.M. Fraser, A.D. Mackay, V.A. Orchard and A.S. Palmer.

ROMANIAN NATIONAL SOCIETY OF SOIL SCIENCE
(SOCIETATEA NATIONALA ROMANA PENTRU STIINTA SOLULUI)

The Romanian National Society of Soil Science held the XIVth Romanian National Soil Conference in Tulcea, Romania (August 30 – September 3, 1994). The theme of the Conference was "Knowledge and development of soil resources and environment protection in the Danube Delta Biosphere Reserve and Northern Dobrogea".

The working programme included two days of symposia mainly focussed on specific soils and environmental problems of the region, and three days of field trips in the Danube Delta and the Northern Dobrogea. A total of 92 papers by 286 authors were presented in 17 oral sessions and 14 poster sessions, covering a variety of themes.

On the occasion of this national conference, the Romanian National Society of Soil Science elected new officers, presented awards and nominated new fellows.

The new Executive Board of the RNSSS, elected for the period 1994 – 1997 includes:

President:	Dr. R. Lăcătuşu, Bucharest
Executive President:	Dr. I. Munteanu, Bucharest
Past President:	Prof.Dr. C. Răuţă, Bucharest
Vice Presidents:	Dr. A Canarache, Bucharest
	Prof.Dr. D. Teaci, Bucharest
Secretary-General:	Dr. I. Niţu, Bucharest
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Soil Genesis, Classification and Cartography: Prof.Dr. N. Florea, Bucharest

Address: Romanian National Society of Soil Science
Dr. R. Lăcătuşu, President
B-dul Mărăşti 61
71331 Bucharest 32
Romania

Tel: +40-1-6172180/275, 117
Fax: +40-1-3123979

SOIL SCIENCE SOCIETY OF AMERICA (SSSA)

At the annual meeting of the SSSA in Seattle/Washington, in November 1994, new officers took over:

Prof.Dr. David E. Kissel, Head of the Department of Crop and Soil Sciences at the University of Georgia as new president and Prof.Dr. H.H. Cheng as president elect. Prof.Dr. Larry P. Wilding is the past president.

AMERICAN SOCIETY OF AGRONOMY
CROP SCIENCE SOCIETY OF AMERICA
SOIL SCIENCE SOCIETY OF AMERICA

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YUGOSLAV SOCIETY OF SOIL SCIENCE

At the Annual Meeting of the Yugoslav Society of Soil Science held in Novi Sad on September 16, 1994, the following officers were elected for the new term 1994–1996.

President:	Prof.Dr. Vladimir Hadžić, Faculty of Agriculture, University of Novi Sad
Secretary-General:	Prof.Dr. Stojan Stojanović, Faculty of Agriculture, University of Belgrade, 11080-Zemun, Nemanjina 6
Vice-Presidents:	Prof.Dr. Dragan Rudić, Faculty of Agr., Zemun
	Prof.Dr. Svetimir Dragović, Faculty of Agr., Novi Sad.
	Prof.Dr. Mirko Brković, Faculty of Agr., Priština.
	Dr. Budimir Fuštić, Institute for Agricultural Research, Podgorica.
Treasurer:	Dr. Ružica Stricević, Faculty of Agr., 11080 Zemun, Nemanjina 6.

The address of the Society is:

Yugoslav Society of Soil Science
Prof.Dr. Stojan Stojanović,
Secretary General
Faculty of Agricultue
11080 Zemun, Nemanjina 6, fah 127
Yugoslavia

Phone: 011-615-315, 198-218; Fax: 011-193-659

KALRA'S SOIL ANALYSIS CROSSWORD

ACROSS

1 A specific gravity scale named after French chemist Antoine _____.
4 A porcelain crucible, with perforated bottom, introduced by American chemist Frank A. _____ in 1878.
6 A mature soil with an organic surface layer above a gray Ae layer resting on a dark illuvial horizon (Bh, Bhf, Bfh, or Bf).
8 The distance between two successive peaks of electromagnetic radiation.
12 The non-mineral fraction of soil: abbr.
13 One of the two types of humus on the forest floor named by Danish forester Müller in 1878.
14 Title: abbr.
15 Tris(hydroxymethyl)aminomethane, a primary standard base: acron.
17 Containing less alcohol than proof spirit: abbr.
18 This micronutrient can be determined colorimetrically as carbamate: sym.
20 Enzyme: suffix.
21 A substance that increases the rate of a chemical reaction but is not required for the stoichiometry of the reaction.
23 Flask/beaker.
25 A vessel used for measuring particle density of soils.
28 For example: abbr.
29 A colorless, odorless, and tasteless tethal gas: sym
30 200 mg; abbr.
31 Contrary: abbr.
33 A logical division of a genus: abbr.
34 Consisting of diverse things: abbr.
35 A solution containing a weak acid HA and its conjugate base A^- or a weak base B and its conjugate acid BH^+.
37 Z of an alkali metal: Roman number.
38 Tubing measurement: abbr.
39 Compounds of this element in soil are one of the principal causes of soil color: sym.
41 Glycerides $C_3H_5(OOCR)_3$ of saturated aliphatic monocarboxylic acids $C_nH_{2n+1}COOH$.
43 Liquid: abbr.
44 In this decay, an electron or positron is ejected from the nucleus of an atom thereby the nuclear charge is increased by one but the mass remains unchanged.
47 Antilog 2.47712: Roman number.
48 To reduce the strength.
50 A prefix or suffix.
51 In 1982 the ISSS Congress was held in this country.
52 Forest litter: horizon designation.
54 To put a question about.
55 Provides an estimate of organic matter in soil: abbr.
56 Racemic mixture (optically inactive): abbr.
57 The time required for the maximum concentration of solute to appear at the end of the column in chromatography: abbr.
58 A heavy radioactive gaseous element: sym.
59 The temperature in the laboratory: abbr.
61 A measure of the spread of analytical values: abbr.
63 Practical wisdom.
67 Eager.
69 The usual choice for carrier gas in GC: sym.
70 The dark-colored colloidal and chemically stable endproduct of the decomposition of soil organic matter.
73 The halogen in the VI period: sym.
74 An alkyl radical : abbr.
76 An overlying rock layer or stratum usually hard to penetrate.

77 First of the three elements discovered by Lecoq de Boisbaudran: sym.
78 The ratio of the velocity of light in the first of two media to its velocity in the second: abbr.
79 Oil: Fr.
83 Unit of wavelength (one ten-billionth of a meter) named after Swedish physicist Anders J. _____ .
85 Cultivating a forest soil typically lowers this ratio: sym.
86 The analytical process of successively adding a standard solution until stoichiometric endpoint is reached.
88 Dr. Bentley was the president of the ISSS when the XI Congress was held in this city.
90 — and fro
91 Australia is the birthplace of this analytical technique that is based on the principle of light absorption by ground state atoms: abbr.
92 The most abundant metal in the earth's crust occuring always in combination: sym.
93 A mineral horizon characterized by a significant amount of exchangeable Na and an enrichment in silicate clay: horizon designation.
94 An alkaline-earth metal that is used as a releasing agent for the determination of Ca and Mg by AAS: sym.
95 Evaporate & condense.
98 The lightest metal: sym.
100 The least quantity possible: abbr.
101 Log (intensity of incident light/intensity of transmitted light): abbr.
102 Permanently wet land having low bearing strength.
104 Molecular weight of the chief acid of vinegar: Roman number.
105 A loose or crumbling calcareous deposit.
107 A chemist at the Waite Agricultural Research Institute, University of Adelaide, Australia, whose book "Soil and plant analysis" was published in 1942.
109 Proton acceptor.
111 An acid oxidant prepared by mixing HNO_3 and HCl in 1 : 3 ratio (v/v): 2 words.
113 One of the highest academic degrees conferred by a university: abbr.
114 An unctuous viscous combustible liquid.
115 Yellowish tinge of the color produced by phenolphthalein in 0.8 N NaOH solution: abbr.
117 A vetch (Vicia ervilia) grown as a forage plant.
120 It can be determined by the micro-diffusion technique: sym.
121 ppm x 10^{-4} : abbr.
122 Potential difference: sym.
123 This procedure employs 0.5 M $NaHCO_3$ (pH 8.5) for extracting P.
124 One trained in chemistry.
127 Plow layer: horizon designation.
128 A provincial organization that assists workers who suffer disablement due to accidents occuring in the course of employment: abbr.
129 Title conferred on the atomic absorption pioneer.
130 An insoluble amorphous or crystalline solid: abbr.
132 Gas evolved when an aqueous mixture of KNO_2 and KI is treated with H_2SO_4: sym.
133 To undergo decomposition from the action of bacteria or fungi.
134 One of the scientific societies of the Agricultural Institute of Canada, formally instituted in 1954: abbr.
135 Three: comb. form.
136 2.54 cm: abbr.
137 Chlorosis due to the deficiency of this element affects most strikingly the interveinal areas of the leaf: sym.
138 Saltpeter.
140 An extractant for simultaneous measurement of available Cu, Fe, Mn and Zn in soil; introduced by Lindsay and Norvell: abbr.
141 Resin code of a plastic used in Nalgene labware with a maximum use temperature of 120°C: abbr.
142 An association of individuals periodically meeting because of a common profession: abbr.
144 German chemist Ernst _____ was the inventor of this two-piece filtering funnel.

147 A coloring matter that turns red in acid solutions and blue in alkaline solutions.
149 Radiation having a wavelength longer than that of X-rays but shorter than that of visible region: abbr.
150 Absorbance or extinction of the medium: abbr.
151 A well-known professor at the University of Wisconsin, Madison whose book "Soil chemical analysis" was first printed in February 1958.
156 An organization dealing with radioisotopes: abbr.
158 Able to withstand unusual strain: abbr.
160 A large bag of coarse strong material that can be used to store and ship soil samples: abbr.
162 A natural soil aggregate that is a unit of soil structure: e.g., prism.
163 A plant hormone: abbr.
164 A soft friable limestone
166 Chloride salt of this element is used for gravimetric and turbidimetric determination of sulfate: sym.
167 A magnet is the heart of the instrument for these measurements: abbr.
169 To generate bubbles of vapor when heated.
172 Power supply: abbr.
174 Bryophytic plants.
175 A salt or ester of HNO_3.
178 Particles (10^{-4} to 10^{-7} cm diam.) too small for resolution with an ordinary light microscope.
179 The purity of these chemicals is between A.R. and U.S.P. grades: abbr.
182 A term (scale 0 – 14) proposed in 1909 by Danish biochemist S.P.L. Soerensen: sym.
183 A physical technique utilizing a sorbent which can be a column, paper, or thin layer: abbr.
184 Either.
185 A back titration procedure for the determination of organic C: 2 words
187 A bivalent element discovered by Swedish scientist Mosander in 1839: sym.
188 Mountain: comb. form.
189 A direction: abbr.
190 A condition that exists at the free surface of a liquid by reason of intermolecular forces about the individual surface molecules: abbr.
192 A garden implement.
193 Commonly: abbr.
194 A readily available supply of nutrients.
195 A radioisotope which was tested in air and rain water samples in Canada following the fallout resulting from the meltdown at the Chernobyl nuclear reactor on 26 April, 1986: sym.
196 $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^2 4p^6 4d^{10} 5s^2 5p^6 4f^{14} 5d^{10} 6s^2 6p^6$ is the electronic configuration of this inert gas: sym.
197 A college in Guelph, Ontario: abbr.
199 Ca, Mg, K, and Na expressed as a percentage of CEC of a soil: abbr.
200 A fractional precipitation method of endpoint detection first proposed by F. _____ in 1856 for argentometric determination of Cl using K_2CrO_4.
202 A New Zealander who published the first paper on the application of AAS for soil analysis in August 1958.
204 A textural class of soil that contains clay ≥ 40 %, sand < 45 % and silt < 40 %.
205 Magnesium sulfate heptahydrate; a.k.a. _____ salt.
207 In ICP analysis, sample solution is nebulized in a stream of this gas: sym.
208 2000 lb: abbr.
211 One of the two elements of the lanthanide series discovered by Austrian scientist von Welsbach in 1885: sym.
213 mg/kg: abbr.
215 Spectral color in the 500-570 nm range: Fr.
216 A device with perforations.
217 Soil: Fr.
218 Dimethylamino-azo-benzene o-carboxylic acid: 2 words.
221 A statistical term for comparing two sets of data: abbr.
223 This micronutrient is essential for the nitrate-reducing enzymes and is also needed for atmospheric N fixation by soil bacteria on legumes: sym.

224 This macronutrient can be determined as oxalate by titration with cerate of permanganate: sym.
226 Red digital display: abbr.
228 Life: comb. form.
229 The soil consistency limits first proposed by a Swedish soil scientist in 1911: 2 words.
231 This element, discovered by Swedish scientist Scheele in 1774, was found to be an essential micronutrient for plants 180 years later by Broyer et al. at the University of California, Berkeley.
234 The upper layer of earth that serves as a natural medium for plants.
235 This element occurs as rutile in granites, gneiss, and limestone: sym.
236 This divided by degrees of freedom gives variance: abbr.
237 A transition element with Z=45: sym.
240 Old symbol of an element that has a new symbol Nb.
242 Portion of the electromagnetic spectrum between visible and microwave radiation: abbr.
243 A dish with a loosely fitting overlapping cover named after German becteriologist Julius R. _____ .
245 Water: Fr.
246 CaO.
249 Soil particles between 0.05 and 2.00 mm in diameter.
251 As much as is sufficient: abbr.
253 A unit for measuring the relative loudness of sounds: abbr.
255 The exponent that indicates the power to which a number is raised to produce a given number: abbr.
257 The second of the three elements discovered by Lecoq de Boisbaudran.
258 A technique closely related to turbidimetry.
259 Grams of a chemical required to prepare 1 N solution, 1 L: 2 words.

DOWN

1 A hydrometer procedure for particle-size analysis introduced by George John _____ in 1926.
2 SI base unit of electric current named after a French physicist: abbr.
3 Multiple of SI unit of energy: abbr.
4 0.035,273,96 Avoirdupois oz.
5 Unit of activity in radiation dosimetry (3.7×10^{10} disintrgrations/sec.): abbr.
6 Reproducibility of analytical results.
7 A widely cultivated cereal grain which weighs 34 lb/bu.
8 Discarded as worthless.
9 Quantity: abbr.
10 Operated by electricity: abbr.
11 2,4-dichlorophenoxyacetic acid; e.g.
13 A soil color designation system based on hue, value, and chroma.
14 A typewritten paper: abbr.
15 A poisonous metallic element resembling Pb in physical properties; a constituent of some pesticides: sym.
16 SI derived unit of electric inductance: abbr.
18 mL: abbr.
19 Unit of heat equal to 1054.4 absolute joules: abbr.
20 Purest grade of reagents: abbr.
21 The total amount of exchangeable cations that a soil can adsorb: abbr.
22 A white precious metal (m.p. 962°C, b.p. 2212°C); sym.
23 Wooded land.
24 The initial high-energy product of photosynthesis that is composed of adenylic acid and two phosphate molecules: abbr.
26 The youth: abbr.
27 Containing more alcohol than proof spirit: abbr.

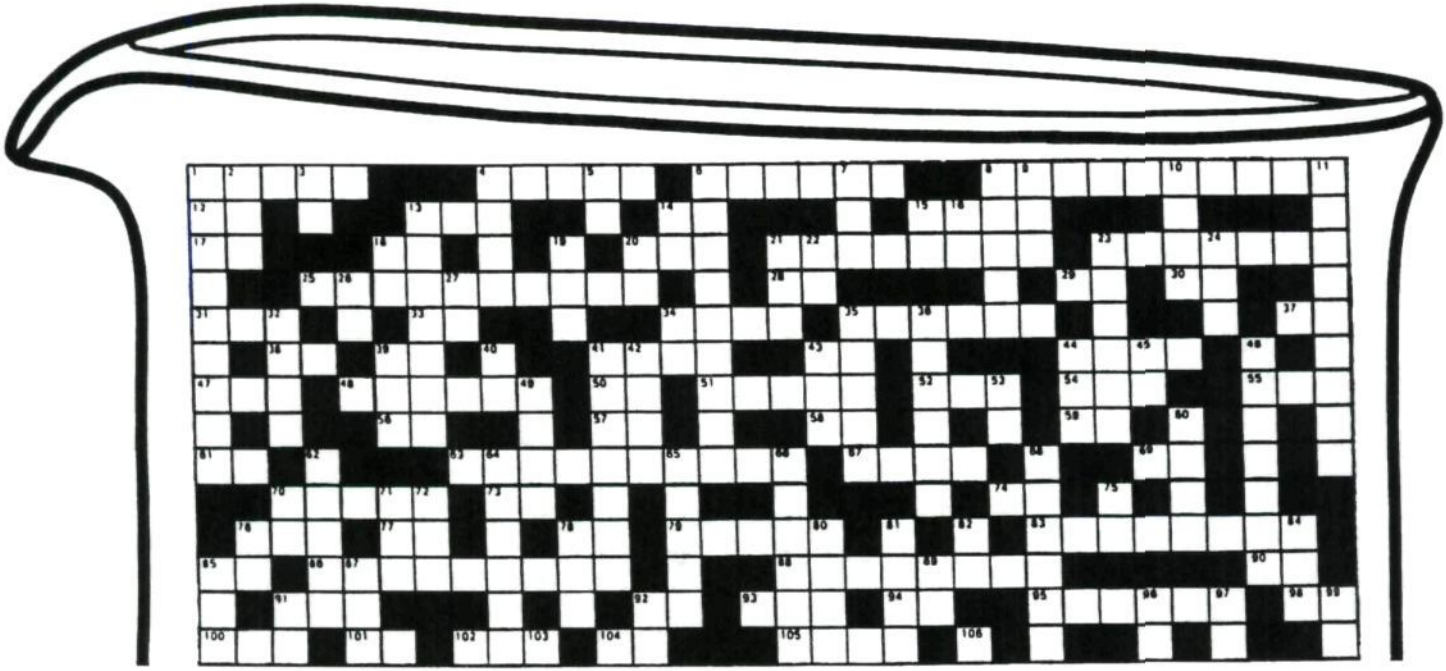
32 SI prefix for 10^{-12} (one trillionth part of): abbr.
34 After use, compressed gas cylinders should be labelled — and stored to await return to supplier: abbr.
35 A solution analyzed with the samples under exactly the same experimental conditions.
36 To separate out matter in suspension.
39 A highly sensitive detector that responds to almost all compounds except the inorganic gases, CS_2 and COS: abbr.
40 30.48 cm: abbr.
41 0.025 M solution of 1,10-phenanthroline ferrous sulfate complex.
42 Opposite: prefix.
43 A tree of the genus Abies.
44 Unit of pressure equal to one million dynes/cm_.
45 Vehicle: abbr.
46 Portion.
49 Test: abbr.
53 The AC spark used as excitation source in emission spectrographic analysis: abbr.
60 Residue of natural vegetation which has been affected by processes of anaerobic decomposition.
62 Editor of the Canadian Journal of Soil Science, 1986.
64 If you spill warm HNO_3 on your finger it becomes yellow due to this reaction characteristic of tyrosine and tryptophan.
65 A univalent aliphatic radical.
66 A flask named after German chemist Emil _____ .
68 A reagent solution of known concentration.
70 2.47 acres (10^4 m): abbr.
71 Pressing: abbr.
72 meq Na/(meq Ca + meq Mg)/2): abbr.
75 A mineral horizon characterized by gray colors or prominent mottling or both: horizon designation.
76 A poisonous radical with a formula weight of 26.018: sym
78 5.5 yd.
80 A multidentate ligand (H_4Y) that has been used as a titrant for the last four decades: abbr.
81 Needed for research.
82 A noble metal (sp. gr. 21.4) discovered in South America by de Ulloa in 1735: sym.
84 SI base unit for the amount of substance: sym.
85 Makeup
87 This pH value of a soil is that of a buffer solution that shows no pH change on coming into contact with the soil.
89 The percentage of exchange saturation with this cation is called the degree of alkalization: sym.
91 The determination of one or more components of a substance.
92 One of the reference lines of a coordinate system: abbr.
96 S: comb. form.
97 Illuminance produced by a flux of one lumen over one square meter: abbr.
99 An emission spectrometric multielement analytical technique: 3 words.
102 In chemical reagents this element can be determined gravimetrically as dimethylglyoximate, oxide, oxyiodide, oxinate, phosphate, and pyrogallate: sym.
103 Soil: comb. form.
106 Soft wet earth.
107 Negative logarithm of the dissociation constant: sym.
108 Inert, insoluble polymer containing charged sites that hold ions by electrostatic attraction.
110 This acid is used as a reductant in the determination of P by the single-reagent method of Murphy and Riley (1962).
112 $CaSO_4 \cdot 2H_2O$.
113 An industrial organic pollutant of lakes, reservoirs and streams; it has been linked to liver and nervous disorders, cancer, birth defects and skin diseases: abbr.
116 Pages: abbr.
118 An element discovered in 1925 by Noddack and Tacke; used in catalysts and thermocouples: sym.

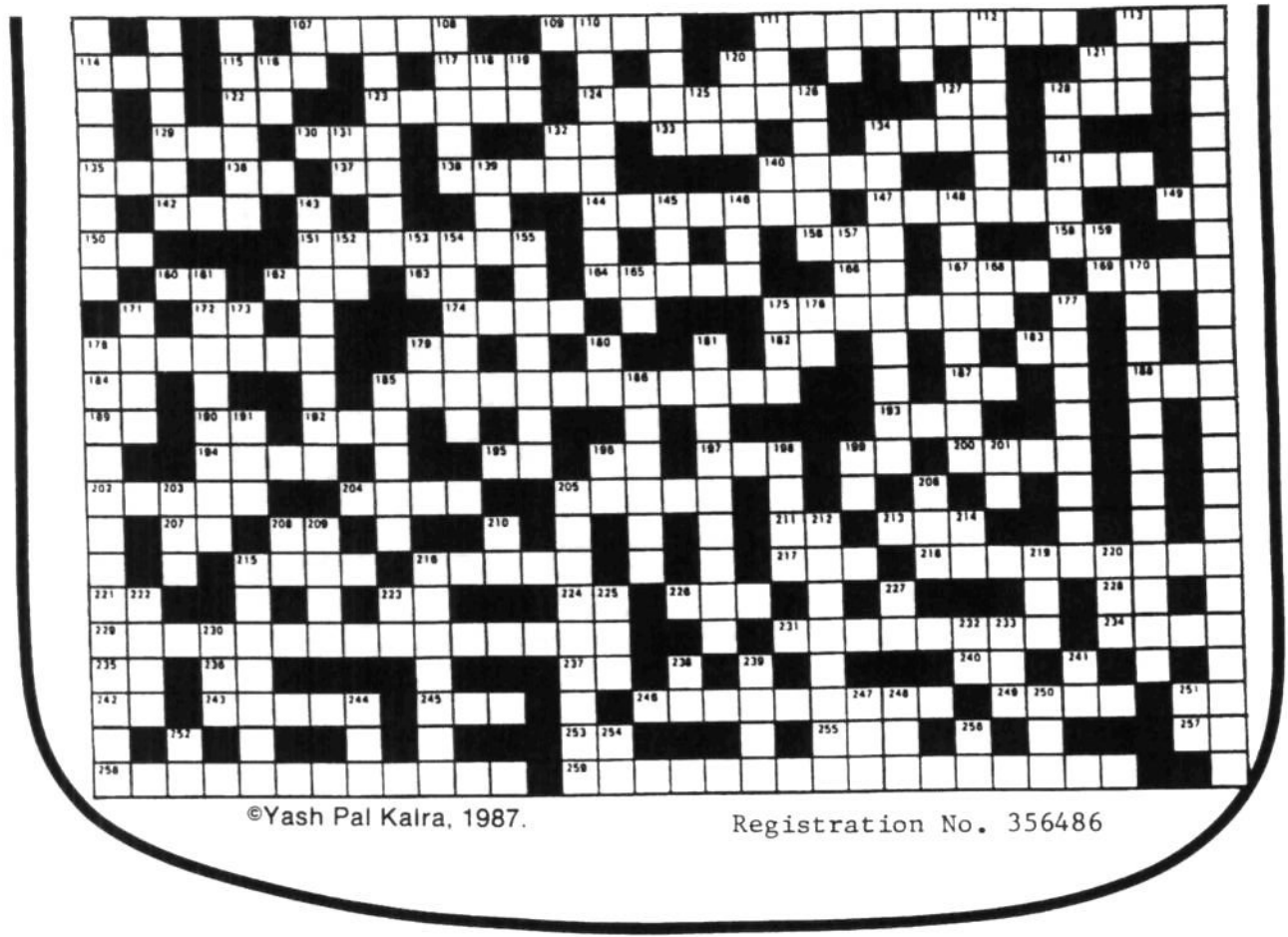
119 A high ratio is a desirable feature in AAS instruments: abbr.
120 Binary digit: abbr.
121 Cash kept on hand for payment of minor items: abbr.
125 The deficiency of this element (at. wt. 95.94) causes Whiptail of cauliflower": sym.
126 Four: prefix.
127 Orpiment and realgar are two of the minerals in soil that are composed of S and this element that was discovered in the 13th century by Albertus Magnus: sym.
128 The effective potential of AAS in analytical chemistry was first demonstrated in early 1955 by this physicist at CSIRO, Melbourne, Australia.
131 A term introduced by Schofield, a British soil scientist for expressing water relationships in terms of free energy: sym.
132 An insert gaseous element used in electric lamps: sym.
134 Soil containing sufficient calcite and/or dolomite to effervesce visibly when treated with dil. HCl.
139 containing the same number of atoms of the same elements but differing in structural arrangement and properties: comb. form.
140 Do the opposite of: prefix.
143 A widely-used method for N developed in 1883 by Danish chemist Johan G.C.T. _____ at the Carlsberg Laboratory in Copenhagen
145 A mineral horizon where lime concentration is higher than in the unenriched parent material: horizon designation.
146 Nutrients listed on a fertilizer bag: sym.
148 A metallic element of the V family found in columbite.
152 Samples that have been allowed to reach equilibrium in moisture content with the surrounding atmosphere: abbr.
153 SI base unit for mass: sym.
154 Results of analysis are only as good as the _____ .
155 An alkaline solution of $K_2[HgI_4]$ used for the colorimetric determination of NH_4-N, first proposed by Julius _____ in 1856.
157 Na 1-(1-hydroxy-2-naphthylazo)-6-nitro-2-naphthol-4-sulfonate, first proposed as an indicator for EDTA titrations by Schwartzenbach of Switzerland in 1948: abbr.
159 Diary: abbr.
161 $CaCO_3$.
165 Added to soil as a fungicide, usually in the form of organic complexes: sym.
168 An alkyl radical: abbr.
170 H_2SO_4: 3 words.
171 A method for soil bulk density.
173 Ketone group.
175 Three essential elements for plants; they were discovered by Rutherford (1772), Brandt (1669) and Davy (1807), respectively: sym.
176 A height dimension: abbr.
177 The measure of the agreement between a test value and the value accepted as true.
178 A major source of error in analysis.
179 Approximately: abbr.
180 Finely divided, partly decomposed organic material accumulated in peat soils in the transition zone between the peat and the underlying mineral material.
181 mu.
185 A society of laboratories that held its 2nd annual workshop "Impact of soil analysis" on 26 – 27 February 1986 in Calgary: acron.
186 German chemist Robert Wilhelm _____ who invented a gas burner with an air regulator.
191 20 cwt.
196 Offprint: abbr.
198 Receptacles for both sample and reference solutions for analysis by continuous-flow analyzers.
199 A horizon enriched with amorphous material, principally Fe and Al: horizon designation.
201 Chemical compound containing OH group: suffix.
203 A place equipped for soil analysis.

205 A conductor used to establish electrical contact with a nonmetallic part of a circuit.
206 Indicates speed of a centrifuge: abbr.
208 A flourimetric method for its determination is based on the formation of a complex with 2,3-diaminonaphthalene, its extraction into cyclohexane and measurement of its flourescence: sym.
209 A woody perennial plant.
210 The heaviest of the three inert gases discovered by Ramsay and Traverse in 1898: sym.
212 $NaKC_4H_4O_6 \cdot 4H_2O$; a.k.a. _____ salt.
214 CH_3: abbr.
215 Na_2EDTA.
216 A liquid capable of dissolving a substance.
219 10YR in the soil color 10YR 2/2.
220 Plural of a unit of mass: abbr.
222 Agitate.
223 A single atom of this element occupies the centre of the porphyrin ring system of the chlorophyll molecule: sym.
225 Residue left after combustible material is oxidized.
227 A radioactive metallic element (named for the native country of its discoverer Mme. Curie) that emits a He nucleus to form an isotope of Pb: sym.
230 The extent to which the adsorption complex of a soil is occupied by Na: abbr.
232 A rapid and sensitive technique based on LC principles that utilizes a conductivity detector: abbr.
233 Over 1,000 standard reference materials, e.g., foliage, estuarine and river sediment, argillaceous and dolomitic limestone, fertilizers, and water are available from this office of the U.S. Department of Commerce, Washington, DC: abbr.
238 A noble metal (sp.gr.19.32) that has 2, 8, 18, 32, 18 and 1 electrons in its K, L, M, N, O, and P orbits: sym.
239 Eight: comb. form.
241 Deficiency of this micronutrient in citrus causes "Little leaf" disease: sym.
244 Computer: abbr.
247 Atom, group of atoms, or compound carrying a positive or negative electric charge from lost or gained electron(s).
248 Key to running a lab efficiently: abbr.
250 Green, blue-green, and diatoms; e.g. abbr.
251 As much as suffices: abbr.
252 The temperature at which the vapor pressure of a liquid is equal to the external pressure: abbr.
254 SI derived unit for activity of radionuclides (replaces Ci): abbr.
256 A light-colored horizon which has given the podzol its name, for the word signifies in Russian ash-colored soil: horizon designation.

KALRA'S SOIL ANALYSIS CROSSWORD

Yash Pal Kalra
10920 – 35 Avenue
Edmonton, Alberta, Canada T6J 2V3





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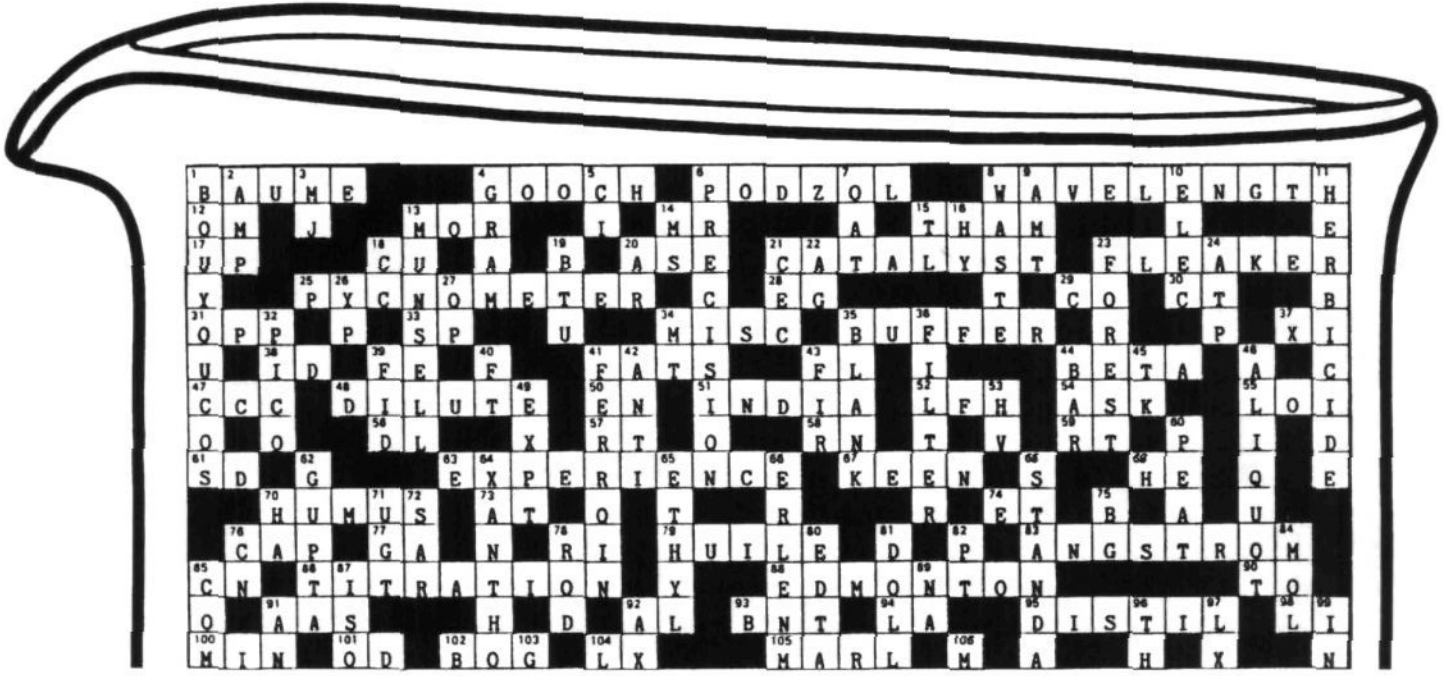
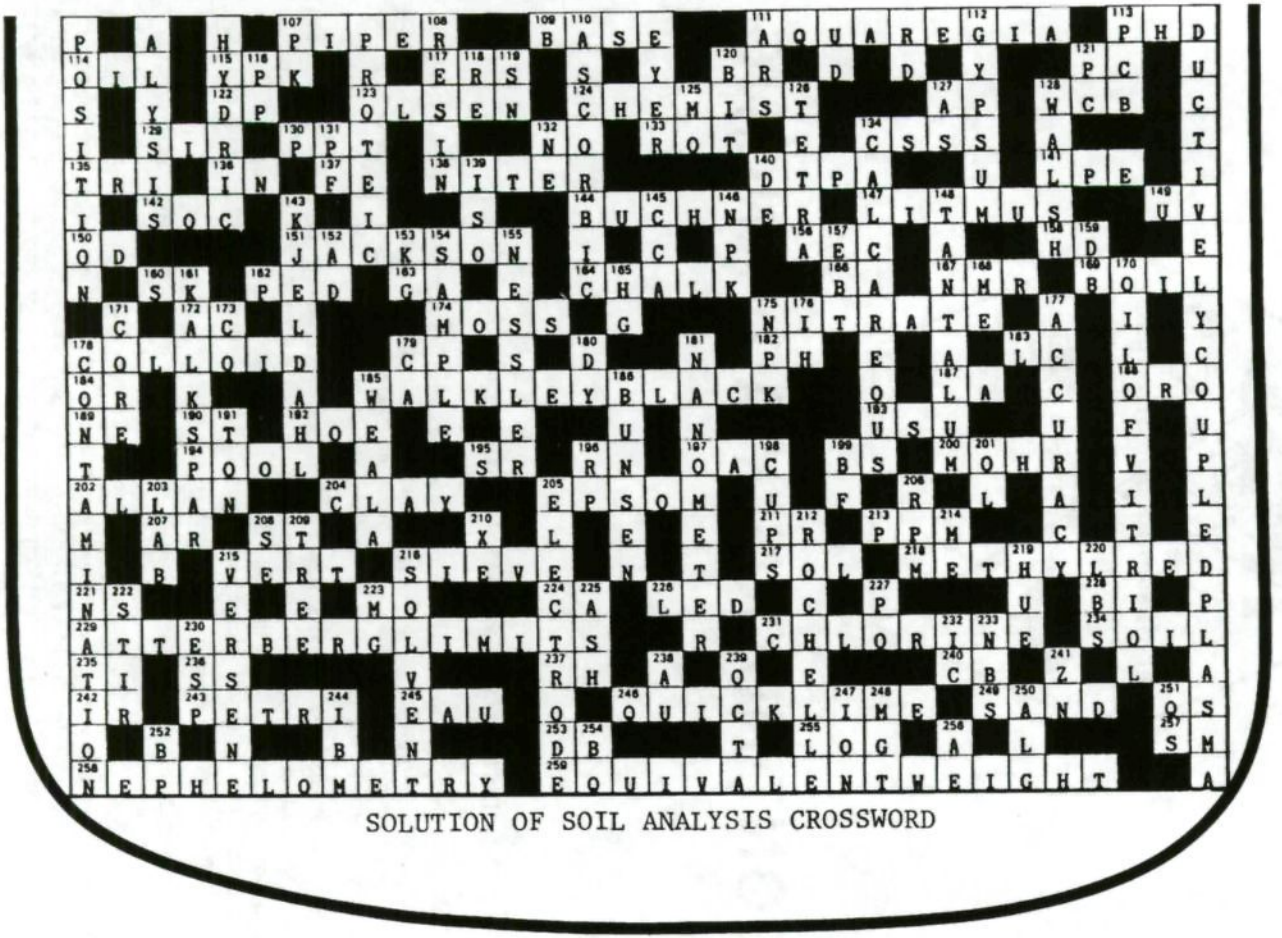
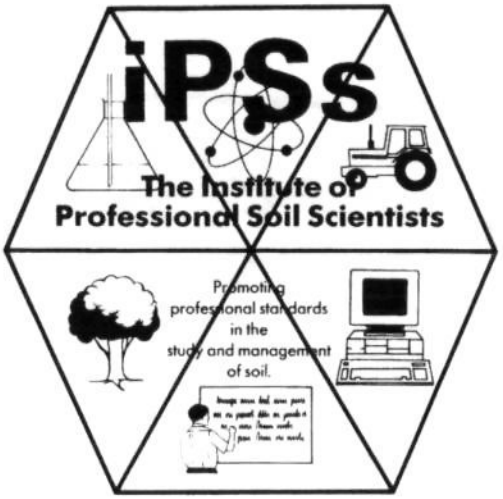




SOLUTION OF SOIL ANALYSIS CROSSWORD



CONTINUOUSLY ADVANCING

INSTITUTE OF PROFESSIONAL SOIL SCIENTISTS (IPSS)

Until 1990, there was no official body representing the interests of professional soil scientists, as there is for many other professionals of long standing such as architects, chemists, engineers, medical and veterinary practitioners. The Institute of Professional Soil Scientists was set up to remedy this deficiency and represent soil scientists at national, regional and international levels.

The aims and objectives of the IPSS have been concisely explained in a leaflet; these are to set and maintain standards of professional competence and to raise the status of soil science. The Institute aims to represent the profession in the public domain at the national and international level. Through accreditation of courses in soil science and related topics, it also hopes to influence the prevailing standards in education and practice of soil science.

Recently graduated soil scientists, at an early stage in their career, with appropriate qualifications are eligible for ASSOCIATE membership. Established qualified soil scientists with at least 5 years professional experience are eligible for MEMBER category (M.I. Soil Sci.) and senior colleagues who have become widely recognised for their expertise and/or have achieved senior positions of responsibility are eligible for the FELLOW category (F.I. Soil Sci.). The Institute has published a directory of members, which has been widely distributed in order to generate interest in IPSS and to encourage enquiries from potential clients.

The Institute offers members the status of professional recognition, ensuring competence for potential employers or other bodies who wish to take advantage of the expertise acquired by soil scientists. Through the publication of a newsletter and the directory, a network of professional contacts is developing. The Institute has arrangements for the provision of professional indemnity insurance in support of Members working within the wide domain of soil science.

Soil scientists have traditionally taken a rather narrow view of their work potential but when the Institute analysed the actual work activities of its members it was obvious that they were applying their expertise in a wide spectrum of situations. Apart from the traditional fields of soil survey and classification, agriculture/horticulture/forestry extension, research and development and education, they were practicing in land reclamation/restoration, soil ecology, environmental protection and monitoring, environmental impact assessment, pollution incidents, waste management, soil hydrology, growing media, leisure/tourism, soil archaeology, product development/technology support and expert witness. Environmental areas are providing an expanding field of possible work for soil scientists so the Institute became a founder member of the Forum For Environmental Professionals in the UK and is now a member of the European Federation of Environmental Professionals.

IPSS aims to ensure that governments, commissions and international agencies recognise the value of soil scientists and consequently request inputs from them in connection with policy development and its implementation. Already in its short life, IPSS has submitted evidence to British governemnt committees of enquiry including a Royal Commission on Environmental Pollution, a Ministry of Agriculture designation of vulnerable areas under the E.C. nitrate directive, a Department of the Environment Consultation Draft on the Preparation of Environmental Statements and a House of Commons Agriculture Committee Inquiry into the Horticulture Industry. In the international field the Institute has responded to a UN Environmental Programme questionnaire on the subject of environmental technology assessments.

Continuous professional development is an important field of activity for any professional organisation for the benefit of its members. IPSS is pursuing this objective via the organisation of conferences and workshops and is considering the accreditation of courses for CPD awards.

IPSS, although originally sponsored by the British Society of Soil Science, embraces a wide outward looking approach regarding its development and is keen to welcome members from European and all countries of the world. It is important to emphasise that the achievement of professional recognition among governments, agencies, employers, clients and the public at large, requires ALL soil scientists to join IPSS in order to support its activities and contribute to its development.

Enquiries can be made to B. Wilkinson, Secretary, Institute of Professional Soil Scientists, The Manor House, Castle Street, Spofforth, Harrogate, North Yorkshire, UK, HG3 1AR. Tel: (44)01937 590376. Fax: (44)01423 506183

ORSTOM 1944 – 1994

"Contribuer par la recherche à gérer au mieux une planète habitable par le plus grand nombre, telle est la vocation de l'Orstom qui, depuis 50 ans, s'attache à étudier les règions les plus chaudes et souvent les plus pauvres de la terre, dans leur réalité actuelle tout à la fois enracinée dans une histoire et porteuse d'un devenir plus ou moins maîtrisable. L'étude dynamique du fonctionnement des milieux, avec toutes leurs composantes et leurs ressources, permet une connaissance approfondie des systèmes, mécanismes et conflits qui régissent, à différentes échelles, l'évolution de notre planète. L'enjeu scientifique de l'environnement et du développement se double en permanence d'un enjeu politique: l'exploitation des ressources doit préserver les capacités d'adaptation des sociétés et de leur environnement."

(Source: "Sciences au Sud 1944-1994)

L'Orstom est bien connu au sein de l'AISS, par les nombreux livres, atlas, cartes, inventaires des sols et communications sur les sols, et principalement ceux de l'Afrique, de l'Amérique Latine et de la région des Caraïbes. Un grand nombre des auteurs de ces documents ont même joué, et continue à jouer un rôle important dans l'AISS, comme par exemple Prof. Georges Aubert (Membre d'Honneur) et l'actuel président de l'AISS, Prof. Alain Ruellan.

L'AISS tient à féliciter l'Orstom pour son 50ème anniversaire!

Winfried E.H. Blum, Secrétaire Général

The Center for Indigenous Knowledge for Agriculture and Rural Development (CIKARD).

Indigenous knowledge is local knowledge – knowledge that is unique to a given culture or society. It is the basis for agriculture, health care, food preparation, education, environmental conservation, and a host of their activities. Such knowledge is passed down from generation to generation, usually by word of mouth. Indigenous knowledge has value not only for the culture in which it evolves, but also for scientists and planners from outside. Development professionals increasingly are seeing the value of this type of knowledge in solving agricultural and environmental problems.

Indigenous knowledge systems often are elaborate. Because they are adapted to local cultural and environmental conditions, they often are superior to modern technology brought in from outside. These knowledge systems are not confined to developing countries. Farmers and other rural people in the developed world also have knowledge systems that are not based on modern science.

CIKARD focuses on preserving and using the knowledge of farmers and rural people around the globe to facilitate participatory and sustainable approaches to development. It was established at Iowa State University in 1987 as part of the Technology and Social Change Program. Its goal is to record indigenous knowledge and make it available to local communities, development professionals and scientists. CIKARD concentrates on four areas: indigenous innovations, knowledge systems (such as taxonomies), decision-making systems (such as what crops to grow on certain soils), and organizations (such as farmers' groups).

The Center has five functions:

- Acting as a clearinghouse for collecting, documenting, and disseminating information on indigenous agricultural and rural development knowledge.
- Developing methodologies for recording this knowledge.

- Conducting training courses and designing materials on indigenous knowledge for extension workers and other host-country nationals.
- Facilitating cross-disciplinary research on indigenous knowledge.
- Supporting the activities of regional and national indigenous knowledge resource centers.

CIKARD has a large and growing database on indigenous soil classification and management systems. In the course of the last few years a number of other global regional and national indigenous knowledge resource centers have been established.

For more information:

CIKARD
Dr. D. Michael Warren, Director
318 Curtiss Hall
Iowa State University
Ames, Iowa 50011
U.S.A.

Fertilizer Consumption

The Fertilizer Situation in 1993/94 According to IFA Fertilizer Consumption and Environment Report, June 1994, it is estimated that world fertilizer nutrient consumption will fall by 4% in 1993/94, following declines of 6% in 1992/93, 3% in 1991/92 and 4% in 1990/91. Nitrogen consumption is expected to fall in 1993/94 by 2%, phosphate by 8% and potash by 9%. The falls are attributable essentially to the former Soviet Union (FSU) and to China.

In the developed countries, including the formerly centrally-planned economy countries, fertilizer consumption fell by 14% in 1992/93, due essentially to falls in the FSU (–38%) and West Europe (–10%). This follows a decline of 8% in 1991/92 and 10% in the previous year. The estimate is a further, but lesser fall, of about 6% for 1993/94, due essentially to the FSU.

In the developing countries, fertilizer consumption increased by 1% in 1992/93, following increases of 4% and 5% respectively in the two previous years. However, the estimate is that consumption fell in 1993/94, for the first time since 1974/75, by 4%. This fall was due largely to a decline of apparent consumption in China.

Forecasted Fertilizer Consumption 1992/93 to 1998/99

Between 1992/93 and 1998/99, world fertilizer consumption is expected to increase at an overall average rate of 1.2%. At this rate nitrogen consumption will have recovered to its 1988/89 level by 1998/99 but phosphate and potash consumption will still be well below the levels of the peak year. In the developed countries, it is expected that fertilizer consumption will begin to recover in 1995. A gradual recovery is expected in Central Europe from 1994 onwards and, hopefully, in the FSU from 1995. Consumption in these regions in 1998, and for some time after that, will be well below the 1989 level.

Between 1992/93 and 1998/99, fertilizer consumption in the developing countries is expected to continue to increase, at an overall average rate of 2.5% per annum.

Conclusion

There are continued uncertainties in China, India and the FSU, but none of these countries can afford to neglect fertilizer use in the medium term. World grain stocks are low and commodity prices have improved. Fertilizer demand has already started to recover in some Central European countries and the rate of all in West Europe has slowed greatly. It seems that world fertilizer demand reached the bottom of the trough in 1993/94 and that it should recover from 1994/95 onwards.

SOMNET
A Global Network of Soil Organic Matter Models and Soil Organic Matter Long-Term Experiment Datasets

A Formal Contribution to the GCTE Soil Organic Matter Task

SOMNET is a global network of soil organic matter (SOM) models and SOM long-term experiments and will be established during 1995. The International Geosphere-Biosphere Programme (IGBP) has identified research on the interactive effects of various components of global change on SOM as of high priority within its Global Change and Terrestrial Ecosystems (GCTE) programme. This project will mark the foundation of a network that is a formal contribution to GCTE Soil Organic Matter Task 3.3.1.

SOM represents a major pool of carbon within the boishpere, acting as both a source and sink. When organic material decomposes, CO_2 is released, but a fraction may become stable, withdrawing it from the active carbon cycle. Changes in climate are likely to influence the rates of accumulation and decomposition of SOM through changes in temperature, moisture and the rate of return of plant residues to the soil. Other changes, especially in land use and management, may have even greater effects. The ability to predict the effects of climate, atmospheric composition and land use change on SOM dynamics is essential in formulating environmental, agricultural and social/economic policies. Mathematical models of SOM dynamics are needed to predict the effects of environmental change, to test specific scenarios and to develop strategies to manage the effects of environmental change. Most models have been developed for using data from a single land use type. The ability of models developed for use in one system (e.g. arable agriculture) to simulate SOM changes in another (e.g. grassland) is a major limitation when simulating the impact of land use change. There is a pressing need to systematically evaluate the suitability of SOM models in predicting the effects of environmental change.

Questionnaires will be sent to holders of datasets to establish nature of sites, type of measurements, quality control measures and the availability of data. Similarly, questionnaires will be sent to developers of models to establish types of models, nature of model inputs and outputs, quality control measures and the availability of the model.

Holders of representative experimental datasets and developers of representative models will be invited to participate in a NATO Advanced Research Workshop to be held May 22–26, 1995, at Rothamsted, UK.

WORKSHOP PLAN

<table>
<tr><th>DATE</th><th>AM</th><th>PM</th></tr>
<tr><td>22/5/95</td><td>Description of datasets</td><td>Descriptions of models</td></tr>
<tr><td>23/5/95</td><td colspan="2" rowspan="3">WORKING SESSIONS

Model Evaluations using selected datasets</td></tr>
<tr><td>24/5/95</td></tr>
<tr><td>25/5/95</td></tr>
<tr><td>26/5/95</td><td>Summing up of model evaluations</td><td>Discussion of model evaluations</td></tr>
</table>

SOMNET will establish a network of researchers investigating the impacts of environmental change on SOM with particular relevance to the validation of mathematical models that can be used to evaluate management and policy options. The collated information will be published as a directory and electronic database to provide information about the source and nature of experimental datasets and SOM models. The NATO Advanced Research Workshop will initiate a comparison of model performance to evaluate representative SOM models using representative long-term experimental data sets. This will establish robustness of simulations over a wide range of environments and expose deficiencies in understanding and/or available experimental data.

SOMNET will be a powerful tool for formulating future innovative multidisciplinary research in this vital area. Such studies, especially the development of robust, appropriate and useable mathemat-

ical models, provide a foundation for management and policy decisions concerning many aspects of environmental change. Questionnaires will be sent out before the end of 1994. If you would like to participate in SOMNET, please contact

Pete Smith,
Soil Science Department, IACR Rothamsted,
Harpenden, Herts, AL5 2JQ, U.K.

Standardization of Land Use and Land Cover Classification Systems

Information on land use and land cover is needed for many purposes. These include economic planning and policy formulation, land use planning, agricultural development, and environmental monitoring and global change. Whatever the purpose, a nomenclature and classification of land use and land cover is a necessary tool. In other words, it is necessary to be able to define and classify the bewildering variety of different uses and production systems, and the types of land cover which result from them. Though the need was always there, it now has a higher priority because of growing concern over the extent to which human activities are affecting the global environment.

Unfortunately a land use is a difficult thing to define objectively and quantitatively, though general categories of land use can be loosely described. For example "agriculture, shifting cultivation, traditional low input subsistence agriculture, conservation forestry", and so on. Thus there are no internationally accepted classification systems for either land use or land cover, and many different systems are in use. But these define even very general categories such as "agriculture" or "forestry" in different ways, so that data from different studies or different countries tend to be incompatible. There are therefore very few global studies, and even these tend to be unreliable.

Land uses are the human activities carried out to obtain goods or benefits from the land. Land cover is the vegetation, or the constructions which cover the earth's surface. Failure to distinguish between the two has lead to much confusion in the past. Land cover is usually a result of land use, and therefore the use can often be deduced from the cover. Since use will often be monitored or mapped through remote sensing, the two classification systems should be linked.

Land uses can probably be defined and classified on the basis of purpose or product, and production sequence; where production sequence is the sequence of activities and the inputs associated with each activity, which are undertaken to produce the output or benefit. This allows quantified econimic, social, and environmental analysis of uses and production systems, and facilitates modeling of alternatives. For land cover a different approach is needed. But there are as many ways to classify as there are identifiable attributes of a land use or cover complex, and therein lies the problem.

It has now become a high priority to harmonize land cover and land use information because of growing concern over the extent to which human activities are affecting the global environment. Many groups and institutions are presently working in this field, or have done so in the past. Due to current interest in global monitoring, and a growing demand for land use and land cover information, the number of groups and projects involved has increased, which could result in development of additional classification systems designed with specific applications in mind. It would be unfortunate if this led to the establishment of different, and perhaps rival, schools of thought which might be very difficult to harmonize in the future.

It is felt that the maximum information exchange would help to minimize this possibility, and would also foster the emergence of an approach which could eventually be suitable for global application. With this in mind, FAO and UNEP, with the support of UNESCO and a number of other organizations, are launching an initiative called LUCLASS.NET, the long-term objective of which is to develop satisfactory land use and land cover concepts, definitions, and classifications, which could eventually gain acceptance world-wide. We wish to emphasize that the aim is not to replace or supplant what other people are doing, but to facilitate discussion and information exchange. The immediate objective is to establish links between groups, such as the IGBP working groups, and institutions and agencies which are too many to list individually here.

It will not be possible to achieve this objective for many years, and therefore the immediate aim will be to develop a means to translate data from existing systems into a common format. It is clear that for proposals to become generally accepted, they must result from a collaborative process involving as many interested people and institutions as possible. The intention is to try to achieve this through an informal networking approach.

Our short-term program is as follows:

1. Identify actors and the institutions already involved or interested through this newsletter and other media.
2. Exchange appropriate information on what everyone else is doing.
3. Encourage and facilitate discussion on concepts and needs.

If you or your institution are interested, we would appreciate it if you would tell us briefly what you are doing and why, and give us your address, fax and telephone number, and Email address if you have one. **Miriam Shomaker,** Environmental Assessment Sub-Programme, UNEP, P.O.Box 30552, Nairobi, Kenya, Tel: +254-2-621-234 (switchboard), +254-2-623-499 (direct), Fax: +254-222-6491, Email: miriam.schomaker@unep.no. **Denis Sims,** Land and Water Development Division, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy. Tel: 39-6-522-53674; Fax:39-6-522-56275; Email: denis.sims@fao.org. **John Latham,** Remote Sensing Centre, FAO, Via delle Terme di Caracalla, 00100 Rome Italy. Tel: 39-6-522-54026; Fax: 39-6-552-55731; E-mail: john.latham@fao.org.

USDA SOIL CONSERVATION SERVICE

On October 20, 1994, the **Natural Resources Conservation Service** (NRCS) was created in the US Department of Agriculture and replaced the Soil Conservation Service (SCS). NRCS combines most of the authorities of the former SCS as well as five natural resource conservation cost-share programs (Wetlands Reserve Program, Water Bank Program, Colorado River Basin Salinity Control Program, Forestry Incentives Program, and Farms for the Future Program) previously administered by other USDA agencies.

NRCS will focus on meeting the critical needs of the land, and these include:

- Soil and soil quality;
- Natural resource assessments;
- Biological restoration of landscapes (to restore wetlands and riparian areas and protect other fragile and ecologically sensitive landscapes);
- Working with people (help land users put conservation on the land for the purpose of protecting natural resources – soil, water, plants, animals, air, and people).

Staff changes are underway. The purpose of all these changes is to better perform our Mission which is, "a productive nation in harmony with nature". Our address remains the same:

USDA Natural Resources Conservation Service
P.O.Box 2890
Washington DC 20013
USA

Telefax: (+1) 202-720-4593

Dr. Hari Eswaran, USA

APPOINTMENTS, HONOURS
NOMINATIONS, DISTINCTIONS
ERNENNUNGEN, AUSZEICHNUNGEN

Prof.Dr. Larry Wilding, President of the SSSA, has been honoured by the Russian Soil Science Society with the commemorative Dokuchaev Jubilee Medal in Soil Science. The honor was presented by Victor Targulian, RSSS Vice President, during a lecture trip to the USA.

Prof.Dr. B.A. Stewart, director of the Dryland Agriculture Institute and distinguished professor of soil science at West Texas A&M University in Canyon, received the Hugh Hammond Bennett Award, the highest honor presented by the Soil and Water Conservation Society (SWCS), for distinguished service and international accomplishments in land and water conservation.

Dr. Samir A. El-Swaify, researcher and professor at the University of Hawaii, was recognized for promoting soil conservation in the tropics through his research and his leadership roles in the International Soil Conservation Organization, the World Association of Soil and Water Conservation, and the International Society of Soil Science.

Prof. J.S. Kanwar, former President of the ISSS, has received the Dr. K. Ramiah Award for distinguished service in agricultural sciences for the year 1994, by the Indian National Academy of Agricultural Sciences (INDA) and a memento by the University of Ludhiana, in recognition of his outstanding contribution, at the occasion of this University's foundation day. Prof. Kanwar is an eminent Agricultural Scientist, well known for his outstanding research contributions particularly in the area of Soil Science and for his leadership in building a strong organisational base for agricultural research at a national and international level.

The following distinguished scientists received **awards from the Soil Science Society of America** during the 1994 annual meeting in Seattle:
Lajpat R. Ahuja, USDA-ARS, David W. Dibb, Potash Phos. Inst., Robert Horton, Iowa State University, Gordon L. Hutchinson, USDA-ARS-NPA, Konrad Mengel, Justus Liebig Universitaet, Wendell A. Norvell, USDA-ARS, Robert F. Powers, USDA-FS, John W. Schafer Jr., Iowa State Univ., James S. Schepers, Univ. of Nebraska, Robert E. Sojka, USDA-ARS were appointed **Fellows**.

Donald L. Sparks, Distinguished Professor of Soil Science and chair of the Department of Plant and Soil Sciences at the University of Delaware received the Soil Science Research Award.

Alfred M. Blackmer, professor of agronomy at Iowa State University, received the Soil Science Applied Research Award.

Charles B. Davey, professor of Soil Science, Forestry and Plant Pathology, who retired from North Carolina State University in 1992, received the Soil Science Applied Research Award.

Friedrich H. Beinroth, professor of soil science in the Department of Agronomy and Soils at the University of Puerto Rico, Mayaguez, received the International Soil Science Award.

Dennis R. Keeney, director of the Leopold Center for Sustainable Agriculture and the Iowa State Water Resources Research Institute at Iowa State University, received an award for Soil Science Professional Service.

James S. Schepers, a soil scientist with the USDA-ARS and adjunct professor in the Agronomy Department at the University of Nebraska, recieved the Werner L. Nelson Award.

Prof.Dr. R. Dudal, Honorary Member of ISSS, has been awarded the Honorary Membership of the Romanian Society of Soil Science, in recognition of his important contribution in the field of soil science.

Prof. Winfried E.H. Blum, Secretary-General of ISSS, received the title "Honorary Member of the Romanian Academy of Agricultural and Forest Sciences Gheorghe Ionescu Sisesti" in November 1994 and was appointed Honorary Member of the Romanian National Society of Soil Science in December 1994, in recognition of his contribution in the field of international soil science.

Dr. Richard Webster, Division of Biomathematics and Department of Statistics of the Institute of Arable Crops Research, Rothamsted, U.K. has received the title of "doctor honoris causa" by the Catholic University of Leuven, Belgium, in March 1995.

IN MEMORIAM

Professor Walter E. RUSSELL

1904 – 1994

Walter E. Russell was a distinguished soil scientist, known and respected internationally for the impact of his broad knowledge of the subject and of its importance to agriculture and agricultural development. He was the first Professor of Soil Science at Reading University and took on the editing and regular revision of Soil Conditions and Plant Growth, the bible on the subject, which his father, Sir John Russell, had first published in 1912.

After graduating as a wrangler in mathematics from Caius College, Cambridge, Russell worked for 18 years in the physics Department at Rothamsted Experimental Station in Hertfordshire where, at the time of his appointment, his father was Director. During that time, Walter Russell was best known for his studies on cultivation and, particularly, deep ploughing of soils used for cereal production.

These studies brought Russell into close contact with the farming community and developed the interest in linking good basic science with agricultural practice which characterised his activities throughout his life. While his time at Rothamsted helped to shape his future, his career really blossomed from the time that he left to become Reader in Soil Science at Oxford University in 1948, thus moving out of his father's shadow.

The breadth and depth of Walter Russell's understanding of soils and plant growth led to many invitations to make overseas visits. These included trips to Africa and resulted in an invitation to become Director of the East African Agriculture and Forestry Research Organisation (EAAFRO). He left Oxford with some reluctance, but entered enthusiastically into the problems of the three countries served by EAAFRO: Kenya, Tanzania (then Tanganyika) and Uganda. His directorship was characterised by his interest in linking sound scientific research firmly to the problems of agricultural development in East Africa. He travelled widely, not only within what he referred to as his parish, but throughout Africa, and he influenced research far beyond.

On retirement from EAAFRO in 1964, Russell became the foundation Professor of Soil Science at Reading University. Although soil science had been taught in Reading since 1890, it had not had the status of a Chair and a department. Walter Russell was the ideal appointment. He brought to Reading his personal stature and authority and gave to the department his stamp of linking sound basic science with understanding of soils and plant growth. He built the department to provide a wide coverage of all aspects of soil science. He saw the department primarily as the "basement of the plant sciences", but also recognised that it was "the attic of the earth sciences". If it had a firm grounding in basic science it could serve both, as well as ecology and environmental science.

Walter Russell's enthusiasm for his subject and for research passed readily to all those who were associated with him. Often accompanied by waving arms and sometimes body, he talked without reserve to all whom he thought would or should be interested. He was for many years secretary of the British Society of Soil Science, took an active interest in the International Society of Soil Science, and was particularly proud of his Honorary Doctorate from the University of East Africa.

Edward Walter Russell, soil scientist; born 27 October 1904; soil physicist, Rothamsted Experiment Station 1930–48; Reader in Soil Science, Oxford University 1948–55; Director, East African Agriculture and Forestry Research Organisation 1955–64; CMG 1960; Professor of soil Science, Reading University 1964–70 (Emeritus); married 1933 Margaret Webster (one son, two daughters); died Birmingham 22 October 1994.

Dennis Greenland

Prof. Dr. Heinrich Zakosek

Friends and colleagues deeply regret the death of Prof.Dr. Heinrich Zakosek, the former vice president of the German Soil Science Society and professor emeritus of soil science at the faculty of agriculture, Rheinische Friedrich-Wilhelms-University in Bonn. He died on October 14, 1994, at the age of 69, in Bonn. He studied agriculture, geology and physics at the universities of Kiel and Bonn, earning his diploma degree in 1949 and his doctoral degree in 1951. He started his professional career at the Geological Survey of Rheinland Pfalz. After moving to the Geological Survey of Hesse, he became the head of its Soils Department in 1959. In this position he improved the provincial soil mapping system and developed a special survey for vineyards, which was published in the internationally well known Wine Growing Atlas, which is still in use for agricultural land use planning. Heinrich Zakosek was especially interested in the genesis and systematics of surface water gleys (Pseudogleys), of semiarid soils, e.g. chernozems, alluvial soils and paleosols, and all types of vineyard soils. He was the chairman of commission V (soil genesis, classification and mapping) of the German Soil Science Society for 8 years.

In 1957, he was commissioned with a lectureship at the Johann-Gutenberg-University in Mainz, where he successfully presented his habilitation thesis about genesis and classification of steppe soils of the Upper Rhine valley and subsequently became an associate professor of soil science. In 1975, he became a full professor of soil science at the Faculty of Agriculture of the Rheinische Friedrich Wilhelms-Universität in Bonn.

He published a great number of scientific articles, monographs and textbooks. Because of poor health he had to resign as director of the Institute of Soil Science in 1983, although he continued with his research activities. For his world wide studies of soils of semi-arid areas and especially his intensive cooperation with colleagues from the People's Rupublic of China, he was awarded a honorary *professorship of the Academia Sinica.*

Peter Felix-Henningsen, Gießen, Germany

MEETINGS, CONFERENCES, SYMPOSIA
REUNIONS, CONFERENCES, SYMPOSIA
TAGUNGEN, KONFERENZEN, SYMPOSIEN

Important Notice

ISSS, as a Scientific Union Member of the International Council of Scientific Unions (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 ISSS member who wishes to participate in the meeting concerned.

1995

International Conference: "Environmental Quality – Natural Variability – Target and Threshold Values", Cologne, Germany, May 1 – 2, 1995.
Information: Dr. Hubert Wiggering, c/o Sachverstaendigenrat fuer Umweltfragen, P.O.Box 5528, 65180 Wiesbaden, Germany; Fax: (+49)611-731-269.

International Conference on "Geomorphic Response of Mediterranean and Arid Areas to Climate Change", Israel, May 9 – 22, 1995.
Information: Conference Secretariat, Mr. Simon Berkowicz, Hebrew University of Jerusalem, Institute of Earth Sciences, GERTEC Conference, Givat Ram Campus, Jerusalem, Israel 91904, Fax: 972-2-66-2581.

3rd International Conference on the Biogeochemistry of Trace Elements "Contaminated Soils", Paris, France, May 15 – 19, 1995.
Information: Ministère de l'Environnement, René Prost, Conférence Internationale sur la Biogeochimie, DGAD/SRAE, 20, Avenue de Segur, 75302 Paris 07 SP, France. Tel: +33(1)4219-1757; Fax: 33(1)4219-1771

International Seminar on management and transfer of information to support agricultural development in China, Beijing, China, May 19 – 24, 1995.
Information: Mr. Yu Ge/Mr. J. Delman, CECAT, 55 Nongzhanbeilu, Chaoyang District, Beijing, P.R. China, Postcode: 100026. Tel: +861-502-6343, Fax: +861-506-3012.

3rd International Meeting on Red Mediterranean Soils, Chalkidiki, Greece, May 21 – 26, 1995.
Information: Dr. C. Kosmas, Dept. of Soils and Agric. Chemistry, Agricultural University of Athens, 75 Iera Odos, Athens 11855, Greece; Tel: +30-1-346-4221; Fax: +30-1-346-4221 or +30-1-346-0885.

International Symposium "The Science of Composting", Bologna, Italy, May 30 – June 2, 1995.
Information: Dr. Guido Del Gizzo, c/o Agrital Ricerche, viale dell'Industria, 24, 00057 Maccarese (Italy); Tel: +39-6-667-8486/-6678357; Fax: +39-6-6678312.

International Workshop on Soil Conservation Extension: Concepts, Strategies, Implementation and Adoption, Chiangmai, Thailand, June 4 – 11, 1995.
Information: Mr. Sompong Theerawong, Organizing Committee Chairman, Deptmt. of Land Development, Paholyothin Road, Bangkok 10900, Thailand. Tel: 66-2-5611954; Fax: 66-2-5611230/5613029/5620313; Telex: 21505 IBSRAM TH.

XVIII Pacific Science Congress, Beijing, China, June 5 – 12, 1995.
Information: Congress Secretariat, Lab. of Climate Research, Institute of Atmospheric Physics, Chinese Academy of Sciences, POB 2718, Beijing 100080, China. Fax: +86-1-2562458.

Conference on Erosion and Land Degradation in the Mediterranean: The Impacts of Agriculture, Forestry and Tourism, Aveiro, Portugal, June 14 – 18, 1995.
Information: Organising Committee of the Conference on "Erosion and Land Degradation in the Mediterranean", c/o Celeste Coelho, Dep. Ambiente e Ordenamento, Universidade de Aveiro, P-3800 Aveiro, Portugal. Tel: +351-34-370200; Fax: +351-34-29290.

AWRA 1995 Annual Summer Symposium "Water Resources and Environmental Hazards: Emphasis on Hydrologic and Cultural Insight in the Pacific Rim", Honolulu, Hawaii, USA, June 25 – 28, 1995.
Information: A. Ivan Johnson, A. Ivan Johnson, Inc., 7474 Upham Court, Arvada, CO 80003; Tel+Fax: +1-303-425-5610

International Conference on "Organic-Mineral Interactions in Sediments and Soils", Newcastle-upon-Tyne, U.K., June 28 – 29, 1995.
Information: Dr. D. Rimmer, Dept. of Environmental Sciences, University of Newcastle, Newcastle-upon-Tyne NE1 7RU, U.K.

Soil and Environmental Chemistry Workshop, Pacific Northwest AOAC International Meeting, Olympia, Washington, June 28 – 30, 1995.
Information: Y.P. Kalra, Canadian Forest Service, 5320-122 Street, Edmonton, Alberta, Canada. Tel: (403)435-7210, Fax: (403)435-7359, E-mail: ykalra@nofc.forestry.ca

International Working Meeting on Archaeological Soil Micromorphology, London, Summer 1995.
Information: Dr. Richard Mcphail, Institute of Archaeology, UCL, 31-34 Gordon Square, London WC1H OPY.

International Conference on ENvironment and INformatics "EN+IN", Budapest, Hungary, June 29 – July 1, 1995.
Information: Viktor Richter, Computer and Automation Research Institute, HAS, 1518 Budapest, P.O.B. 63, Hungary, Fax: +361-186-9378.

41st Annual Conference of the Canadian Society of Soil Science and Symposium on Greenhouse Gas Emissions from Soil Ecosystems, Quebec City, Canada, July 22 – 28, 1995
Information: Dr. Regis Simard, Agriculture and Agri-Food, Station de recherches, 2560 boul. Hochelaga, Sainte-Foy (Quebec), Canada G1V 2J3; Tel: (418)657-7980, Fax: (418)648-2402

Malama 'Aina 95: First International Conference on Multiple Objective Decision Support Systems for Agricultural and Environmental Management: Concepts, Approaches, and Applications, Honolulu, Hawai'i, USA, July 23 – 29, 1995.
Information: Department of Agronomy and Soil Science, College of Tropical Agriculture and Human Resources, 1910 East West Road, Honolulu, Hawai'i 96822, USA. Tel: 808-956-8708 or 7530; Fax: 808-956-6539.

XIV International Congress of the International Union for Quaternary Research, Berlin, Germany, August 3 – 10, 1995.
Information: Congress Partner GmbH, Emmastr. 220, 28213 Bremen; Tel: +49-421-219073, Fax: +49-421-216419

International Symposium on Soil and Plant Analysis: Quality of Soil and Plant Analysis in view of Sustainable Agriculture and the Environment, Wageningen, the Netherlands, August 5 – 10, 1995
Information: IAC-Section OCC, P.O.Box 88, 6700 AB Wageningen, The Netherlands, Tel: +31-8370-90287, Fax: +31-8370-18552

XX IUFRO (International Union of Forestry Research Organizations) World Congress, Tampere, Finland, August 6 – 12, 1995.
Information: Prof. Risto Seppälä, The Finnish Forest Research Institute, IUFRO'95 Secretariat, Unioninkatu 40A, SF-00170 Helsinki, Finland; Tel.: +358-0-857-051; Fax: +358-0-625-308

ECGA Euroclay '95, Leuven, Belgium, August 19 – 25, 1995.
Prof. P. Grobet, Secretary Euroclay '95, Centrum voor Oppervlaktechemie en Katalyse, K.U. Leuven, K. Mercierlaan 92, B-3001 Heverlee, Belgium. Tel: +32-16-220931; Fax: +32-16-295126.

3rd All African Soil Science Conference, Ibadan, Nigeria, August 19 – 26, 1995
Information: Dr. Charles R. Obatolu, Secretary LOC, 3rd All African Soil Science Conference, c/o Department of Agronomy, University of Ibadan, Ibadan, Nigeria. Fax: 022-310-491

BSSS 1995 Annual Conference, University of Reading, U.K., Autumn 1995.
Information: Martin Wood, Dept. of Soil Sciences, University of Reading, Whiteknights, Reading RG6 2DW

Third International Conference on Modelling of Global Climate Change and Variability, Hamburg, Germany, September 4 – 8, 1995.
Information: Dr. Lydia Dümenil, Max-Planck-Institut fuer Meteorologie, Bundesstrasse 55, 20146 Hamburg, Germany; Tel: +49-40-41173-310; Fax: +49-40-41173-366.

XII International Symposium on Environmental Biogeochemistry – "Biosphere and Atmospheric Changes", Rio de Janeiro, September 4 – 8, 1995.
Information: Secretariat of the XII ISEB, Prof. Luis Henrique Melges, Instituto de Geociencias – UERJ, R.S. Francisco Xavier, 524-s.4019B, 20550-013 Rio de Janeiro, Brazil; Fax: 55-(0)21-248-4870; E-mail: iseb@bruerj.

Joint BAHC GCTE DIS Workshop on "Testing Global Landcover Algorithms, and Inferring Vegetation Parameters from a Global Landcover Classification", Montana, USA, September 6 – 9, 1995.
Information: Steven W. Running, School of Forestry, University of Montana, Missoula, MT 59812, USA; Tel: +1-406-243/6311, Fax: /4510; swr@ntsg.umt.edu.

International Symposium and Field Seminar on Karst Waters and Environmental Impacts, Antalya (Turkey), September 10 – 20, 1995.
Information: Prof.Dr. Gültekin Günay, Int. Res. & App. Center for Karst Water Resources (UKAM), Hacettepe University, 06532 Beytepe Ankara, Turkey; Tel: +90-312-235-2543, Fax: +90-312-235-2862
or:
A. Ivan Johnson, A. Ivan Johnson Inc., 7474 Upham Court, Arvada, CO 80003, USA; Tel+Fax: +1-303-425-5610,

International Conference on Soil Resource and Sustainable Agriculture for East and South-East Asia (Soilsafe), Kualalumpur, Malaysia, September 12 – 15, 1995.
Information: Dr. A.R. Anuar, SOILSAFE, Department of Soil Science, Universiti Pertanian Malaysia, 43400 UPM Serdang, Selangor D.E., Malaysia; Tel: 03-9486101-2640; Fax: 03-9483745; Telex: uniper ma 37454

International Conference: "Driven by Nature: Plant Litter Quality and Decomposition", Wye, Ashford, Kent, U.K., September 17-20, 1995
Information: Georg Cadisch and Ken Giller, Dptmt. of Biological Sciences, Wye College, University of London, Wye, Ashford, Kent, TN25 5AH, UK, E-mail: g.cadisch@wye.lon.ac.uk, Fax: +44-233-813140, Tel: +44-233-812401.

BAHC focus 4 Joint Meeting, in conjunction with the NATO Workshop on the Evaluation of Soil Erosion Model, place to be specified later, September 18 – 20, 1995.
Information: Dr. Brad Bass, AES, CCC, 4905 Dufferin Street, Downsview, Ontario M3H 5T4, Canada. Tel: +1-416-739-4353, Fax: -4297, E-mail: bbass@cid.aes.doe.ca

ESSC International Workshop on "Problems and Management of Soil Conservation in Europe", Russia, Moscow, September 18 – 24, 1995.
Information: Prof. M.S. Kuznetsov, Moscow State University, Fac. of Soil Science, 119899 Moscow, Russia. Tel: (095)939-5929; Fax: (095)939-0989

International Symposium on Salt-Affected Lagoon Ecosystems – ISSALE-95, Valencia, Spain, September 18 – 25, 1995.
Information: Prof.Dr. Jorge Batlle-Sales, Departamento de Biología Vegetal, Facultad de Farmacia. Universitat de València, Avda. Vicent Andrés Estellés, Burjasot, Valencia, Spain; Tel: +34-6-3864-289, Fax: -926 and -289, E-mail: Jorge.Batlle@uv.es.

IX Reunión Nacional Sobre Cuaternario – Reconstrucción de Paleoambientes y cambios climáticos, Madrid, 25 – 28 de Septiembre de 1995.
Información: Dra. Trinidad Aleixandre Campos, IX Reunión Nacional sobre Cuaternario, Centro de Ciencias Medioambientales. CSIC, Serrano 115 Dpto., 28006 Madrid, Spain.

Global Analysis, Interpretation, and Modelling, The First GAIM Science Conference, Garmisch-Partenkirchen, Germany, September 25 – 29, 1995.
Information: IGBP Secretariat, Institut fuer Meteorologie, Freie Universität Berlin, Carl-Heinrich-Becker-Weg 6-10, 12165 Berlin, Germany

Third International Symposium on Headwater Control "Sustainable Reconstruction of Highland and Headwater Regions" (Hans Keller Memorial Symposium), Delhi and Himachal Pradesh, India, October 6 – 15, 1995.
Information: Dr. R.B. Singh, HC3 Convenor, Delhi School of Economics, Delhi –110007, India; Fax: +91-11-725-7049.

FISOLS 95 – Fifth International Symposium On Land Subsidence, The Hague, The Netherlands, October 16 – 20, 1995.
Information: Secretariat FISOLS 95, Mr. F.H. Schroeder, c/o Netherlands Geodetic Commission, P.O. Box 5030, 2600 GA Delft, The Netherlands. Tel: +31-15-782819; Fax: +31-15-782745.

III Congreso Latinoamericano de Ecología, Mérida, Venezuela, 22 – 28 Octubre 1995.
Información: Dr. Jaime E. Pefaur, Secretario Ejecutivo, III Congreso Latinoamericano de Ecología, Facultad de Ciencias, Universidad de Las Andes, Mérida 5101, Venezuela, Tel: (58-74)401305; Fax: (58-74)401286; E-mail: CLAEIa.ve

International Congress on Soils of Tropical Forest Ecosystems, Balikpapan, Kalimantan, Indonesia, October 30 – November 03, 1995.
Information: Indonesian-German Forestry Project, Faculty of Forestry/Mulawarman University, Dr. Andreas Schulte – Dr. Daddy Ruhiyat, P.O.Box 1227, Samarinda 75123, East Kalimantan/Indonesia, Tel: +62-541-35089, Fax:+62-541-35379:

Soil Chemistry and Ecosystem Health, St. Louis Mo., USA, November 1995.
Information: Prof. P.M. Huang, Dept. of Soil Science, Univ. of Saskatchewan, Saskatoon, SK, S7N 0W, Canada. Fax: +1-306-966-688.

Soils and the New Zealand Environment: Pollution and Remediation, Hamilton, New Zealand, December 4 – 7, 1995.
Information: Malcolm McLeod, Landcare Research NZ Ltd, Private Bag 3127, Hamilton, New Zealand. Tel: 07-838-4441; Fax: 07-838-4442; E-mail: MCLEODM@LANDCARE.CRI.NZ

1996

International Conference on Disasters and Mitigation, Madras, India, January 19 – 22, 1996.
Information: Dr. A.R. Santhakumar, Dean (Academic Research) & Professor in Civil Engineering, Chairman, INCODIM, Structural Engineering Division, Anna University, Madras-600 025, India; Tel: 2351723, 2351787 Ext: 3322, 3313, Fax: 091-44-2350397, E-Mail: annalib@sirnetm.ernet.in.

1st Australasia-Pacific Conference on Contaminants and Soil Environment in the Australasia Pacific Region, Adelaide, Australia, February 19 – 23, 1996.
Information: Dr. Ravendra Naidu, CSIRO Division of Soils, Private Mail Bag No. 2, Glen Osmond, Adelaide, South Australia 5064.

World Summit for Social Development, Copenhagen, Denmark, March 11 – 12, 1996
Information: Mr. Delmar Blasco, Executive Director, ICVA, Case postale 216, 1211 Geneva 21, Switzerland; Tel: +41-22-732-6600, Fax: +41-22-738-9904; E-mail: DIALCOM: TCN4092 and UNX024
or:
Ms. Sirpa Utriainen, Secretary General, ICSW, Koestlergasse 1/29, 1030 Vienna, Austria; Tel: +43-1-587-8164; Fax: +43-1-587-9951

IV International Symposium on Plant-Soil Interactions at Low pH, Belo Horizonte/Minas Gerais, Brazil, March 17 – 24, 1996.
Information: Symposium Manager, IV Intl. Symposium on Plant-Soil Interactions at Low pH, Avenida dos Andradas, 2287 Sala 309, 30120-010 Belo Horizonte, MG, Brazil; Tel: 55-31-241-2096; Fax: 55-31-241-2827.

1st International Symposium on Tropical Savannas: "Biodiversity and Sustainable Production of Food and Fibers in the Tropical Savannas", Brasília, Brazil, March 24 – 29, 1996.
Information: 1st Sympsium on Tropical Savannas, Att. Ms. Lucilene M. Andrade, EMBRAPA-CPAC, Caixa Postal 08.223, Planaltina, DF 73301-970, Brazil; Tel: 55-(61)-389-1171; Fax: 55-(61)-389-2953.

Joint BAHC GCTE GEWEX Workshop on "Bidirectional Ecosystem-Atmosphere Interactions at the Mesoscale", Brazil, April – May, 1996.
Information: Roni Avissar, Meteorology & Phys. Oceanography, Rutgers Univ., Cook College, Box 231, New Brunswick, NJ 08903-023, USA; Tel: +1-908-932/9520/9387/9027, Fax: /7922, E-mail: avissar@gaia.rutgers.edu.

9th International Congress on Soilless Culture, St. Helier, Jersey, Channel Islands, April 12 – 19, 1996
Information: Secretariat of ISOSC, P.O.Box 52, 6700 AB Wageningen, The Netherlands

International Conference on Environmental Pollution, Budapest, April 15 – 19, 1996.
Information: Prof. B. Nath, Chairman of the Organising Committee, ICEP Conference Office, 253 Kilburn Lane, London W10 4BQ, UK. Tel: +44-81-960-6823; Fax: +44-81-960-1597

Ten years terrestrial radioecological research following the Chernobyl accident, Vienna, Austria, April 22 – 23, 1996.
Information: Dr. Andreas Baumgarten, Federal Research Institute of Horticulture, Gruenbergstrasse 24, 1131 Vienna, Austria.

Sexto Congreso Nacional y Conferencia Internacional de Geología Ambiental y Ordenación del Territorio "Riesgos Naturales, Ordenación del Territorio y Medio Ambiente", Granada, 24 al 27 abril 1996
Información: VI CNGAOT. Dpto de Congresos de Viajes Sacromonte. C/Angel Ganivet 6. 18009 Granada. Tel: 958-225598/9; Fax: 224617; Telex: 78484.

10th International Peat Congress, Bremen, Germany, 27 May – 2 June 1996.
Information: Prof.Dr. Jens Dieter Becker-Platen, Chair of the Organizing Committee, Deutsche Gesellschaft f. Moor- u. Torfkunde e.V., P.O.Box 51 01 53, 30631 Hannover, Germany. Fax: +49-511-6432304.

10th International Working Meeting on Soil Micromorphology, Moscow, Russia, June 1996.
Information: Dr. V.M. Sefanova, Faculty of Soil Science, Moscow State University, 119 899 Moscow, Russia. Fax: +7-095-939-0989; E-mail: fater.inbox@parti.inforum.org.su.

Soil Structure – Physical Processes and Functions in Ecosystems, June 1996, Kiel, Germany.
Information: Prof.Dr. R. Horn, Inst. of Plant Nutrition and Soil Science, Cristian Albrechts University, Olshausenstr. 40, 24118 Kiel, Germany. Tel: +49-431-880-3190, Fax: +49-431-880-2940

International Conference on the Fertility of Chernozem, its Conservation and Rational Use, Kharkov, June 1996.
Information: Institute for Soil Science and Agrochemistry Research, Ukrainian Academy of Agrarian Sciences, Chajkovsky str., 4, Kharkov, 310024, Ukraine.

International Meeting on Land Degradation "Inappropriate Land Use" and "Soil Erosion", Adana, Turkey, June 10 – 14, 1996.
Information: Prof.Dr. Selim Kapur, Secretary of the Intl. Meeting on Land Degradation, University of Çukurova, Dept. of Soil Science, 01330-Adana, Turkey

Impact of Minerals-Organics-Microbes Interactions on Soil and Freshwater Environments, Nancy, France, July 1996.
Information: Prof. P.M. Huang, Dept. of Soil Science, University of Saskatchewan, Saskatoon, SK S7N 0W0, Canada; Fax: +1-306-966-688.

4th Congress of the European Society for Agronomy, Veldhoven and Wageningen, The Netherlands, July 7 – 11, 1996.
Information: ESA Fourth Congress, Kongresservice Brabant, P.O. Box 140, NL-5500 AC Veldhoven, The Netherlands, Fax: +31-40-545515, from October 9, 1995: +31-40-2545515.

10th International Working Meeting on Soil Micromorphology, Moscow, Russia, July 8 – 13, 1996.
Information: Dr. V.M. Safonova, Faculty of Soil Science, Moscow State University, Moscow 119899, Russia. Fax: +7-095-939-0989; E-mail: fater.inbox@parti.inforum.org.su.

International Symposium on Erosion and Sediment Yield: Global and Regional Perspectives, Exeter, UK, July 15 – 19, 1996.
Information: Prof. D.E. Walling or Dr. B.W. Webb, Dptmt. of Geography, University of Exeter, Amory Building, Rennes Drive, Exeter, EX4 4RJ, UK; Tel: +44-392-263345 or -263334, Fax: +44-392-263342, E-mail: b.w.webb@exeter.ac.uk.

XII International Colloquium on Soil Zoology, Dublin, Ireland, July 21 – 26, 1996.
Information: Dr. T. Bolger, Department of Zoology, University College Dublin, Belfield, Dublin 4. Tel: +353-1-706-2300; Fax: +353-1-706-1152; E-mail: TBOLGER@IRLEARN.UCD.IE.

30th International Geological Congress, Beijing China, August 4 – 14, 1996
Information: Secretariat Bureau, 30th International Geological Congress, P.O. Box 823, Beijing 100037, P.R. China.

International Workshop on "Soil and Water Quality at Different Scales", Wageningen, The Netherlands, August 7 – 9, 1996.
Information: Dr. P.A. Finke, Winand Staring Centre, P.O.Box 125, 6700 AG Wageningen, The Netherlands. Tel: +31-8370-74258; Fax: +31-8370-24812; E-mail: p.a.finke@sc.agro.nl.

Second International Congress of the European Society of Soil Conservation (ESSC): Development and Implementation of Soil Conservation Strategies for Sustainable Land Use, München-Weihenstephan, Germany, September 1 – 7, 1996.
Information: Dr. Karl Auerswald, ESSC Congress, Lehrstuhl fuer Bodenkunde, TU München, 85350 Freising, Germany. Fax: +49-8161-714466.

9th Nitrogen Workshop, Braunschweig, Germany, September 9 – 12, 1996.
Information: R. Nieder, Technische Universität Braunschweig, Langer Kamp 19c, 38106 Braunschweig, Germany. Telefax: (0531)391-8170.

International Symposium on Soils with Gypsum, Lleida, Catalonia, Spain, September 13 – 19, 1996.
Information: Dr. Rosa M. Poch, Secretary ISSWG, Dep. Medi Ambient i Ciències del Sòl, UdL, Av. Rovira Roure 177, 25198 Lleida, Catalonia, Spain. Tel: +34-73-702-567; Fax: +34-73-238-264.

Joint BAHC GCTE DIS Workshop on "Large-Scale Pattern & Process in Root System Structure and Dynamics", USA, September/October 1996.
Information: Bhaskar Choudhury, NASA-GSFC, Code 974, Greenbelt, Maryland 20771, USA; Tel: +1-301-286/5155; Fax: /1758.

Maximizing Sustainable Rice Yields Through Improved Soil and Environmental Management, Khon Kaen, Thailand, November 11 – 17, 1996.
Information: Prof. Dr. Tasnee Attanandana, Soil and Fertilizer Society of Thailand, Department of Soil Science, Faculty of Agriculture, Kasetsart University, Bangkok 10900, Thailand. Tel: (662)-579-9538; 579-2028; Fax: (662)561-4766.

ICSC-2: The 2nd International Crop Science Congress, New Delhi, India, November 17 – 23, 1996.
Information: Suresh K. Sinha, Secretary General, Second International Crop Science Congress, IARI, Pusa, New Delhi-110 012, India.

Soil Resilience and Sustainable Land Use for Small Holdings, Dhaka, Bangladesh, November 20 – 23, 1996.
Information: Dr. Z. Karim, M.D., BARC, Farmgate, New Arpat Road, Dhaka, Bangladesh; Tel: 311432:884232.

1997

XVIII International Grassland Congress, Grasslands 2000, Winnipeg, Manitoba & Saskatoon, Saskatchewan, Canada, June 8 – 18, 1997.
Information: P.O.Box 4520, Station C, Calgary, Alberta, Canada T2T 5N3; Tel: (403)244-4487, Fax: (403)244-2340

11th International Clay Conference, Ottawa, Ontario, Canada, June 15 – 21, 1997.
Information: Dr. Jeanne B. Percival, Secretary-General, 11th ICC, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario, Canada K1A 0E8. Fax: 613-943-1286; Internet: icc97@gsc.emr.ca; use gopher.emr.ca (GSC menu) for future updates on the 11th ICC.

14th ISTRO Conference: Agroecological and Economical Aspects of Soil Tillage, Lublin, Poland, July 27 – August 4, 1997.
Information: ISTRO Conference 1997, Dr. Jerzy Rejman, Institute of Agrophysics, Polish Academy of Sciences, ul. Doswiadezalna 4, 20-236 Lublin, Poland; Tel: +48-81-45061; Fax: +48-81-45067.

IV International Conference on Geomorphology of the International Association of Geomorphologists, Bologna, Italy, August 28 – September 3, 1997.
Information: IV International Conference on Geomorphology, PLANNING CONGRESSI s.r.l. Via Crociali 2, 40138 Bologna, Italy.

6th Internatinal Conference on Agrophysics, Lublin, Poland, September 15 – 18, 1997.
Information: R. Debicki, Institute of Agrophysics, Polish Academy of Sciences, Doswiadczalna 4, P.O.Box 121, 20-236 Lublin, Poland; Tel: +48-81-450-61, Fax: +48-81-450-67; E-mail: debicki@demeter.ipan.lublin.pl.

1998

XVIth World Congress of Soil Science, Montpellier, France, August 20 – 26, 1998
Information: XVI World Congress of Soil Science, Congress Secretariat, 1101, Avenue Agropolis, 34394 Montpellier Cedex 5; France; tel: (+33)67 04 75 38; fax: (+33)67 04 75 49

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- a great number of technical short courses

Information: University of Florida, International Programs /FANR, Training Unit, P.O. Box 110329, Gainesville, Florida, 32611-0329, USA. Tel: (+1)-904-392-1965; Fax: (+1)-904-392-7127; Internet: ITD@GNV.IFAS.UFL.EDU.

Master Course "Fertilizers and Environment", Universidad Autónoma de Madrid, June/July 1995.
Information: Prof. D. Cadahía Lòpez, director, Dpto. Química Agrícola, Geología y Geoquímica, Universidad Autónoma de Madrid, 28049 Madrid, España. Tel: 91-3974823, Fax: 91-3974187

34th International Post-Graduate Course on Land Drainage, August 14 – November 24, 1995, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands.
Information: ILRI, Lawickse Allee 11, 6701 AN Wageningen, The Netherlands; mailing address: ILRI, P.O.Box 45, 6700 AA Wageningen, The Netherlands, Tel: (+31)8370-90144, Fax: (+31)8370-17187.

College on Soil Physics, Miramare-Trieste, Italy, September 11 – 29, 1995.
Information: International Centre for Theoretical Physics, College on Soil Physics, P.O.Box 586, 34100 Trieste, Italy Tel: +39(40)2240111; Cable: CENTRATOM; Telex 460392 ictp i; Fax: +39(40)224163; Gopher server address: gopher.ictp.trieste.it

ORSTOM training course for hydrologists, on "New Technologies in Surface Hydrology. Data Acquisition and Data Processing", Montpellier, France, October 1995.
Information: Mr. B. Thebe, Laboratory of Hydrology, ORSTOM B.P. 5045, 34032 Montpellier cedex 01; Tel: +33-6761-7545, Telex: orst mpl 485 507 f; Fax: +33-6741-1806 or 6754-7800

2-week course on "Modern Techniques in the Identification of Bacteria and Filamentous Fungi", Egham, U.K., 26 June – 7 July 1995;
and
International Course on the Identification of Fungi of Agricultural Importance, Egham, U.K., 7 August – 15 September 1995;
Information: Miss J. Pryse (Training Officer), International Mycological Institute, Bakeham Lane, Egham, Surrey, TW20 9TY, U.K. Tel: +44-784-470111; Fax: +44-784-470909; E-mail: j.pryse@cabi.org

19th International Course on Nutrient Management for Sustainable Agriculture, IAC Wageningen, The Netherlands, August 27 – September 23, 1995.
Information: International Agricultural Centre, P.O.Box 88, Lawickse Allee 11, 6700 AB Wageningen, The Netherlands; Fax: +31-8370-18552, Tel: +31-8370-90111, Telegrams: INTAS, Telex: 45888-INTAS NL; E-mail: IAC@IAC.AGRO NL.

8th International Course on Local Management of Trees and Forests for Sustainable Land Use, IAC Wageningen, The Netherlands, September 3 – December 8, 1995.
Information: International Agricultural Centre, P.O. Box 88,
6700 AB Wageningen, The Netherlands; Fax: +31-8370-18552.

International Course on Environmental Assessment for Sustainable Land Use, IAC Wageningen, The Netherlands, October 22 – November 4, 1995.
Information: International Agricultural Centre, P.O. Box 88,
6700 AB Wageningen, The Netherlands; Fax: +31-8370-18552.

International Course on Design of Soil and Water Conservation Programmes, IAC, Wageningen, The Netherlands, November 19 – December 2, 1995.
Information: International Agricultural Centre, P.O.Box 88, 6700 AB Wageningen, The Netherlands; Fax: +31-8370-18552.

ITC Postgraduate Diploma and MSc Degree Courses, Enschede, The Netherlands,
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Information: ITC, P.O.Box 6, 7500 AA Enschede, The Netherlands, Tel: +31-53-874-206; Fax: +31-53-874-238; Telex: 44525 itc nl.

International Postgraduate Course "Modern Crop Protection: Developments and Perspectives", Wageningen, The Netherlands.
Information: International Training Centre (PHLO), Wageningen Agricultural University, P.O. Box 8130, 6700 EW Wageningen, The Netherlands; Tel: +31-8370-84092/3, Fax: +31-8370-26547.

ITC Workshop on Information Management for Natural Resource Development, early March 1996, duration: 3 weeks
Information: ITC Student Registration Office, Attn. Ms. A. Scheggetman, P.O.Box 6, 7500 AA Enschede, The Netherlands, Tel: +31-(0)53-874-204; Fax: +31-(0)53-874-238; Telex: 44525 itc nl, E-mail:scheggetman@itc.nl.

Silsoe College, Bedford, England, offers a wide range of post-graduate courses and studies, e.g.: **Agribusiness Management and Technology (MSc.), Agroforestry (MSc.), Land Resource Management and Planning (MSc. and Postgraduate Diploma programmes), Engineering for Rural Development (MSc.), Agricultural Engineering (Agrochemicals Application Technology – MSc., etc.), Management for Agricultural Development (MSc.), Agricultural and Food Marketing (MSc. and PD), Agricultural Water Management (MSc.), Crop Production Technology (MSc.), Information Technology (MSc.),** etc.
Information: The Student Recruitment Executive, Silsoe College, Silsoe, Bedford MK45 4DT, U.K.; Tel: (0525) 860428; Fax: (0525) 861527; Telex: 826383 silcam g

Cursos de Magister en Ciencias Agrícolas (Suelos y Producción Vegetal) y Doctorado en Agronomía de aproximadamente 2 y 4 años de duración en la Universidad Nacional del Sur (UNS) Bahía Blanca, Argentina. Idioma: Español. Frecuencia: permanente.
Informes: Prof.Dr. R.A. Rosell, Agronomía, UNS, 8000 BAHIA BLANCA, ARGENTINA (Tel.: 54-91-30024/26533; Fax: 54-91-27876; Telex: 81712 DUJOR AR).

ICRAF Training Materials for Agroforestry, Nairobi, Kenya.
Information: International Council for Research in Agroforestry, P.O.Box 30677, Nairobi, Kenya (Tel.: 254-2-521450; Fax: 521001; Telex: 22048).

External Programme, specialised courses on Managing Agricultural Development, Environmental Management in Agricultural Development, Kent, UK.
Information: The External Programme, Wye College, University of London, Ashford, Kent TN25 5AH UK (Tel.: 0233 812401; Fax: 0233 813320; Telex: 94017832 WYEGG).

Masters, Postgraduate Diploma and Graduate Certificate Courses in Soil Management and Conservation, Adelaide, Australia.
Information: The Head, Department of Soil Science, Waite Agricultural Research Institute, University of Adelaide, P.M.B. 1, Glen Osmond, South Australia 5064 (Tel.: +61 8 303 7210; Fax: +61 8 303 6511; Telex: UNIVAD AA 89141).

2-Year Master Programme in Water Resources Engineering (Options: Irrigation, Hydrology, Water quality management)
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Information: Institute for Land and Water Management, K.U. Leuven, Vital Decosterstraat 102, 3000 Leuven, Belgium.
Tel: +32-1623-1381, Fax: +32-1623-0607, E-mail: agr@cc3.kuleuven.ac.be
or
Laboratory for Hydrology, V.U. Brussel, Pleinlaan 2, 1050 Brussel, Belgium; Tel: +32-2629-3021; Fax: +32-2629-3022; E-mail: hydr@vub.ac.be.

International Summer Courses on "Microcomputer Applications in Water Resources Engineering and Management", Leuven, Belgium.
Information: Mrs. Greta Camps, Course Secretary, Institute for Land and Water Management, Vital Decosterstraat 102, 3000 Leuven, Belgium. Tel: +32-1623-1381, Fax: +32-1623-0607, E-mail: agr@cc3.kuleuven.ac.be

M.Sc. Programmes at the Department of Agricultural Engineering, University of Nairobi, Kenya, 1991/1993.
Information: University of Nairobi, Dept. of Agricultural Engineering, P.O. Box 30197, Nairobi, Kenya.

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Information: ITC Student Registration Office, P.O. Box 6,
NL-7500 AA Enschede, The Netherlands
Tel: +31 53 874 205, FAX: 053 874 238, Telex: 44525 itc nl
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Master of Science in Eremology (Interdisciplinary, 2-Year, Post-Graduate Programme in Desert Science), Ghent, Belgium, starting each year in October.
Information: The International Center for Eremology, Faculty of Agricultural and Applied Biological Sciences, University of Ghent, Coupure Links 653, B-9000 Gent, Belgium.
Tel.: +32-9-2646036; Fax: +32-9-2646247; Telex: 12754 rugent b
4

M.Sc. Courses in "Irrigation Engineering" and "Soil Conservation and Land Reclamation".
Information: Information: The Course Administrator, Effective Irrigation Management Short Course, Institute of Irrigation Studies, The University, Southampton SO9 5NH, UK (Tel.: (0703) 593728; Fax: (0703) 593017; Telex: 47661 (a/b sotonu g).

Sponsored Training Courses on Use of Isotope Techniques in Soil Research and Plant Nutrition, International Atomic Energy Agency, Seibersdorf, Austria.
Information: IAEA Headquarters, Joint FAO/IAEA Division, Vienna International Center, Wagramerstr. 5, P.O. Box 100, A-1400 Vienna, Austria.

M.Sc. in Conservation of Soil Fertility, Canterbury, England.
Information: Dr. R.G. Burns, Biological Laboratory, University of Kent, Canterbury, Kent CT2 7NJ, U.K.

Post-graduate Training Courses in Soil Science and Plant Biology, Granada/ Sevilla, Spain.
Information: Dr. M.L. Garrido, Estacion Experimental del Zaidin, Avenida de Cervantes, Apdo. 419, Granada, Spain.

Farming Systems Approaches to Upland Conservation and Watershed Management in the Tropics, University of Hawaii.
Information: S.A. El-Swaify, Chairman, Dept. of Agronomy and Soil Science, College of Tropical Agriculture and Human Resources, University of Hawaii, Honolulu, Hawai 96822.

International Post-graduate Training Course in Eremology, (Desert Science), Ghent, Belgium.
Information: The International Center for Eremology, University of Ghent, Coupure Links 653, B-9000 Gent, Belgium (Tel.: ++32-91-646036; Fax: ++32-91-646247).

School of Development Studies, University of East Anglia, Norwich, England.
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Master's and Advanced Course in Soil Science, International Training Centre for Post-Graduate Soil Scientists, Ghent, Belgium.
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Post-graduate Courses in Soil Science, Plant Production, and Ecology. MSc and PhD Degree, Universidad de Buenos Aires, Argentina.
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International Agriculture Courses at MSc. Level, Larenstein International Agricultural College, The Netherlands.
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4

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The Economics of Organic Farming: An International Perspective. N.H. Lampkin and S. Padel, editors. CAB International, Wallingford, 1994, 480 p. ISBN 0-85198-911-X. Hardback.

Organic (ecological) farming, with its emphasis on sustainable agro-ecosystem management and the use of locally-derived, renewable resources, offers potential solutions to some of the key problems faced by the agricultural sectors of industrialized countries. Many European governments now provide direct financial support for organic farming in recognition of its contribution to current policy objectives, including environmental protection, conservation of non-renewable resources, controlling over-production and the reorientation of agriculture towards areas of market demand. Drawing on studies from the UK, USA, Canada, Australia, Germany, Denmark and Switzerland, this book provides an international review of the economics of organic farming.
Price: GBP 49.95; (USD 85.00 Americas only)
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Soil Fertility Research in East Africa. An annotated bibliography. CAB Abstracts. CAB International, Wallingford, 1994, 169 p. Paperback.

Over 60 years of literature has been abstracted to produce 1,100 records in this bibliography, which is also available in disk format. Content includes: (1) Soil organic matter, processes and management including decomposition and mineralization; soil fertility; leys, fallows and rotations; mulch; the use of manures, residues and composts; (2) Soil nutrients: nitrogen; phosphorus; potassium and calcium; sulphur; trace elements; (3) Soil structure and physical properties; (4) Erosion; and (5) The effect of trees on soil.
Orders to: in Africa: Rockefeller Foundation, PO Box 47543, Nairobi, Kenya. *Elsewhere:* see below.

Soil Science and Sustainable Land Management in the Tropics. J.K. Syers and D.L. Rimmer, editors. CAB International, Wallingford, in association with the British Society of Soil Science, 1994, 320 p. ISBN 0-85198-874-1. Hardback.

An understanding of the properties of soils, particularly those of tropical regions where soil fertility is usually low and the need for food production high, is central to the development of sustainable land management systems. This book examines the contribution that soil science can make to sustainable land management in the tropics, through a series of review chapters and case studies. Four main themes are addressed – soil and land resource evaluation, soil biology, soil erosion and conservation, and soil fertility and fertility management – although topics such as Quaternary geology and the economic context of soil science are also covered. Case studies include work from Zimbabwe, Thailand and the Philippines. The contributions have been developed from papers presented at a meeting of the British Society of Soil Science held in Newcastle upon Tyne.
Price: GBP 45.00 (USD 75.00 Americas only)
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Chemical Principles of Environmental Pollution. B.J. Alloway and D.C. Ayres. Chapman & Hall, 1993, x + 291 p. ISBN 0-7514-0013-0. Paperback.

This book provides a scientific approach and comprehensive introduction to the subject of environmental pollution and is written in a manner which is accessible to undergraduate chemists, environmental scientists, biologists, geologists and geographers. It can also be read with advantage by those concerned about pollution who have a basic knowledge of chemistry. Organisation of the coverage is pollutant-centred and this serves to focus attention on the essential chemical aspects of each topic. The sources, chemical properties and transport of pollutants in the environment and their reactions in soils, air and water are all discussed, along with their associated toxicological effects and methods of monitoring, analysis and disposal.

Readers of the book will obtain an understanding of the scientific principles of pollution at a chemical level and will be able to approach the contentious issues surrounding this subject in a rational way. It is suited as a course text for degree programme modules in environmental chemistry, pollution and related topics.
Price: GBP 17.95
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Soil Micromorphology: Studies in Management and Genesis. Developments in Soil Science 22. A.J. Ringrose-Voase and G.S. Humphreys. Elsevier Science Publishers, Amsterdam, New York, 1994, xiv + 886 p. ISBN 0-444-89792-5. Hardback.

This volume contains refereed papers presented at the IX International Working Meeting on Soil Micromorphology organised under the auspices of Subcommission B of the ISSS. The meeting was held in July 1992 in Australia.

During the last two decades there has been a shift in emphasis of much micromorphological research, with a move away from developing guidelines for description and classification of microstructure, fabric and pedological features towards applications of micromorphology. These applications cover a considerable range of pure and applied research endeavour and applications ranging from pedogenesis to engineering. This shift in emphasis is apparent in the present volume, which contains sections focusing on the contribution of micromorphology to studies on soil genesis, paleosols, soil biota, soil structural measurement, soil management and crusted and indurated soils.
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Regolith Exploration Geochemistry in Tropical and Subtropical Terrains. Handbook of Exploration Geo-

chemistry 4. C.R.M. Butt and H. Zeegers, editors. Elsevier Science Publishers, Amsterdam, New York, 1992, xxii + 607 p. ISBN 0-444-89095-5. Hardback.

Given the complexities of regolith development in humid and arid tropical areas, it is obviously vital to understand the processes in order to comprehend and interpret geochemical patterns in the regolith. This fundamental truism is reflected by the editors devoting the first Part of the book to a thorough description and discussion of the chemical and physical processes of weathering and geochemical dispersion. In some sense these are the most important part of the book: many "failures" of exploration geochemistry in the secondary environment are directly attributable to an inadequate understanding of surface processes.

Parts II, III and IV of the book address specific exploration practice using gossans, and applications in savannas, rainforests, semiarid and arid terrains, and dissected terrains and tropical mountains. Part V gives a description of specific techniques for diamonds, gold and uranium in tropically weathered terrains, and the use of heavy mineral surveys in lateritic terrains. The final section – Summary and Conclusions – is a succinct statement of all that is important in regolith exploration geochemistry in tropical and subtropical terrain.
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Global Wetlands: Old World and New. W.J. Mitsch, editor. Elsevier Science Publishers, Amsterdam, Lausanne, 1994, xxiv + 967 p. ISBN 0-444-81478-7. Hardback.

This book contrasts both wetland ecology and wetland management in the Old and New Worlds. The diversity of wetlands covered is extensive, with discussions on many "crown Jewel" wetlands of the world. Examples from the New World include the Pantanal (Brazil), the Paraná River Delta (Argentina), and the Chesapeake Bay (USA) among others. An introduction explores the extent of the wetlands, an overview of the topics covered in this book, the history of wetland management, and a vision of where wetland management should lead us in the 21st century.

This book represents the written record of 11 of the 14 symposia and 3 overview papers of the international meeting held in Columbus in 1992. But rather than a repetition of what was presented at the meeting, the papers in this book provide a great deal of material that has been updated since the 1992 conference. The book is divided in the following five parts: Introduction (3 papers); Biogeochemistry (15 p.); Ecological Engineering (18 p.); Modelling and Analysis (13 p.); and Policy and Management (23 p.). The book has also a listing of the final resolutions.
Price: NLG 500; USD 285.50
Orders to: see below.

Rock Fragments in Soil: Surface Dynamics. Special Issue of Catena (Vol. 23, nos 1-2). J. Poesen and H. Lavee, editors. Elsevier Science Publishers, Amsterdam, New York, 1994, 198 p. Paperback.

Considerable attention has been paid to the study of the role played by the finest particles in conditioning a soil's behaviour. Much less attention has been devoted to the effects of the coarsest soil fraction. Over the last decade, there has been a growing interest in soils containing considerable amounts of rock fragments, for several reasons. First of all, these soils are widespread, particularly in the Mediterranean area. Secondly, soils with large amounts of rock fragments represent a significant portion of our land resources to be increasingly used for food and fibre production as well as for recreation with the ever present potential of undesirable soil degradation. Information on the behaviour of these soils is especially needed because of their potential benefits or limitations for landuse. Finally, there is a growing need for more quantitative information on the effects of rock fragments on various hydrological and soil degradation processes. Such information is required in order to improve process-based models aiming at predicting the effects of climatic or landuse changes on the response of these soils. All papers in this special issue are an attempt to elucidate the role played by rock fragments in hydrology, soil degradation and soil productivity by drawing together results of recent research.
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Advances in Porous Media. Vol. 2. M.Y. Corapcioglu, editor. Elsevier, Amsterdam, New York, 1994, xv + 451 p. ISBN 0-444-81723-9. Hardcover.

The objective of the series is to provide a forum for publications on developments in this fast-growing interdisciplinary area, with special emphasis on the frontiers of knowledge and on a unified approach by scientists from such diverse fields as civil, mechanical, agricultural, environmental, chemical, ceramic, mining and petroleum engineering, geohydrology, soil physics, powder metallurgy and mathematics.

The present volume reviews the transport of reactive solutes in soils, the variety of origins, structures, and occurrences of non-linear waves in porous media, the anion exclusion phenomenon in soils, critical concentration models, electrokinetic flow processes in porous media and various approaches to model flow and contaminant transport in fractured porous media.
Price: NLG 350; USD 200.
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Sustainable Land Use Planning. Development in Landscape Management and Urban Planning 6E. H.N. van Lier, C.F. Jaarsma and C.R. Jurgens, editors. Elsevier, Amsterdam, New York, 1994, xvi + 360 p. ISBN 0-444-81835-9. Hardcover.

This book deals entirely with the new challenge of sustainable land use. Land use planning refers to the planning of the future of the land. In principle this counts for all forms of land use: urban, industrial, infrastructural, rural and many more. The topics dealt with in this book primarily focus on rural land use. Sustainable land use planning refers then to the planning, reconstruction and management of land in order to better serve future generations. In the recent past, new methods were developed in land use planning such as GIS, multi-functional planning methods and integration of new societal goals. Many questions have to be answered, such as what is sustainability actually, how can it be achieved, what role can land use planning play and finally how can it be incorporated in

existing land use planning methods? The book tries to give answers to most of these questions by demonstrating new policies, new methods, and examples of projects that include sustainability in land use planning.
Price: NLG 305; USD 174.25
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Applications of Ecological Economics in Developing Countries. Special Issue Vol.11 No 2 of Ecological Economics, Elsevier, Amsterdam, New York, 1994, 77 p. ISSN 0921-8009.

Much of the original theoretical and applied work in ecological economics focused on developed countries. In the industrialized nations, information-gathering systems are relatively advanced, social structures are fairly stable, and environmental conditions are frequently less than life-threatening. By contrast, circumstances in many developing countries provide dramatic challenges to analysts and decision-makers.

The first reason of this special issue is to draw attention to the role ecological economics is playing – and should play – in addressing some of the key environmental issues in the developing world. And second, because this theme is consistent with the ongoing activities at the Centre for Sustainable Regional Development. The papers in this volume provide some insight into how ecological economics is being applied in selected developing countries.
Requests to: in the US and Canada: Elsevier Science Inc., PO Box 945, Madison Square Station, New York, NY 10160-0757, U.S.A; *Elsewhere:* Elsevier Science Publishers, PO Box 1991, 1000 BZ Amsterdam, the Netherlands.

FAO Publications

Soil Tillage in Africa: Needs and Challenges. FAO Soils Bulletin 69. FAO, Rome, 1993,xiv + 190 p. ISBN 92-5-103442-7. Paperback.

This publication addresses issues related to tillage, from the soil resources in Africa and tillage needs and practices to some of the climatic factors to consider in decision-making for tillage. It discusses soil sealing and crusting, a widely occurring phenomenon, particularly on sandy soils in the semi-arid areas of the region. A chapter on adoption of conservation tillage in Zimbabwe is included as an example of tilalge practices in some of the countries in the region.

Introduction à la Gestion Conservatoire de l'Eau, de la Biomasse et de la Fertilité des Sols (GCES). Bulletin Pédologique de la FAO 70. E. Roose. FAO, Rome, 1994, xviii + 420 p. ISBN 92-5-203451-X. Cartonné.

Après analyse des stratégies paysannes et des stratégies modernes de lutte antiérosive, ce document propose une nouvelle approche, la GCES, basée sur la valorisation des terres et du travail des paysans. Sur le plan pratique, la GCES vise améliorer l'infiltration, à valoriser la biomasse et à mieux gérer les nutriments disponibles pour la croissance des plantes. Cette synthèse est étayée par les résultats de 30 années de recherches, essentiellement en Afrique francophone, et à travers la présentation de dix études de cas en Afrique de l'Ouest, en montagne (Haïti, Equateur, Rwanda, Algérie) et en région tempérée (France).
Orders to: FAO Publications Sales, Via delle Terme di Caracalla, 00100 Rome, Italy.

Non-CO_2 Greenhouse Gases. Why and How to Control? J. van Ham, L.J.H.M. Janssen and R.J. Swart, editors. Kluwer Academic Publishers, Dordrecht, Boston, 1994, xl + 562 p. ISBN 0-7923-3043-9. Hardback.

This is the first book dedicated to the non-CO_2 greenhouse gases (NCGGs), notably methane, nitrous oxide, CFCs, HCFCs and HFCs and tropospheric ozone and its precursors. It covers all aspects of these components in global warming and discusses possible remedies. It also contains the Conference Statement which summarizes our present knowledge.

The book includes studies directed towards sources and sinks of NCGGs and atmospheric measurement, and documents the OECD/IPCC methodology for emission inventories and some applications. Studies on the modelling of global budgets reflect our present understanding of the atmosphere. It contains also helpful reports on methods to curb the emissions of the NCGGs, as well as on policy approaches to their support, including those of the European Union, The Netherlands, and the UN Food and Agricultural Organization.
Price: NLG 295; GBP 124; USD 189.
Orders to: see below.

Opportunities, Use, and Transfer of Systems Research Methods in Agriculture to Developing Countries. Systems Approaches for Sustainable Agricultural Development 3. P. Goldsworthy and F. Penning de Vries, editors. Kluwer Academic Publishers, Dordrecht, Boston, in cooperation with ISNAR and ICASA, 1994, xiii + 366 p. ISBN 0-7923-3205-9. Hardback.

Although application of systems approaches in agricultural research and natural resource management is a rather new field, there is already increasing demand for implementation of these approaches. This will require a critical mass of specialists in national agricultural research systems and international agricultural research centers. While these institutions are setting themselves up for systems research, the experience that has been gained in this area needs to be evaluated, further possibilities need to be explored, and new objectives need to be set.

This book contains the papers of a seminar held in November 1993 in The Hague. In 24 chapters, it assesses the state-of-the-art of systems approaches in agricultural research, resource management, and rural planning, and gives an impression of the evolution of this interdisciplinary field and its use.
Price: NLG 240; GBP 101; USD 153.50
Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A. *Elsewhere:* Kluwer Academic Publ. Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Beyond the Biomass. Compositional and functional analysis of soil microbial communities. K. Ritz, J. Dighton and K.E. Giller, editors. John Wiley & Sons, Chichester, New York, 1994, xiv + 275 p. ISBN

0-471-95096-3. Hardback.

The soil microbial biomass concept has been vigorously adopted by soil scientists since its inception some 15 years ago. The ability to quantify microbial pools of nutrient elements and the fluxes of such nutrients between microbial and other compartments of the soil has enabled great advances in the analysis of nutrient cycling in soil systems to be made. However, a major drawback of the biomass concept is that it constitutes a 'black box' approach, and as such is highly generalised. Many soil microbiologists believe that the biomass concept needs extending to acknowledge the diversity of microbial form and function which exits within the total microbial pool.

In March 1993, an international symposium was organized to provide a forum for the reporting and discussion of contemporary ideas on characterising complex microbial communities, the functional analysis of such communities and their interactions with other components of the biota, especially in relation to nutrient cycling. The chapters in this book are based on the oral presentations made by researchers at the meeting. The contributions range from overviews of the biomass concept itself, through specific techniques being developed at the forefront of research, to more philosophical pieces. In the final chapter, the main themes which emerged during the formal and informal discussion sessions are summarized. The symposium was organized under the auspices of the British Society of Soil Science and the International Society of Soil Science.
Price: GBP 75; USD 120.
Orders to: see below.

The Future of the Land. Mobilizing and integrating knowledge for land use. L.O. Fresco, L. Stroosnijder, J. Bouma and H. van Keulen, editors. John Wiley & Sons, Chichester, New York, 1994, xix + 432 p. ISBN 0-471-95017-3. Hardback.

Land use planning has developed rapidly in the past decade, with the growth of geographical information systems, an increased awareness of the fragility of the earth's resources and the inclusion of all parties – especially the users – in the decision-making process.

Initially, case studies look at land use at four different scales: supranational, national, regional and farm level. The remainder investigates issues cutting across all the scales including topics such as recent developments and their consequences, integrated planning methods and sustainability. All points of view are offered in land use planning to provide the reader with all the options available.
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The Biological Management of Tropical Soil Fertility. P.L. Woomer and M.J. Swift, editors. John Wiley & Sons, Chichester, New York, 1994, viii + 243 p. ISBN 0-471-95095-5. Hardback.

A review of the potential for biological management of tropical soils which focuses on the four main research themes of the UNESCO Tropical Soil Biology and Fertility Programme – soil organic matter management, nutrient use efficiencies, manipulation of the soil water regime and the potential for utilisation of soil fauna for soil fertility improvement. Each of these themes is discussed together with accompanying material which sets the context of the drive for sustainable agriculture, lays the foundations for the agroecological approach to soil management and discusses the socio-economic implications of this research. The book was put together using contributing authors who have worked together in the field and at international workshops.
Price: GBP 60; USD 96.
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Biogeochemistry of Small Catchments. A tool for environmental research. SCOPE 51. B. Moldan and J. Černý, editors. John Wiley & Sons, Chichester, New York, 1994, xxvii + 419 p. ISBN 0-471-93723-1. Hardback.

Small catchments provide attractive opportunities for biogeochemical research as they encompass a number of interacting components: atmosphere and vegetation, plants and soils, bedrock and groundwater, surface waters and surrounding land, in an easily recognisable natural topographic boundary. This book presents data mainly gathered from northern temperate regions, with one chapter on studies in tropical countries. The focus is on the fluxes of chemical elements, both across the boundary of the catchment and within the catchment itself.

As small catchment research requires a multidisciplinary approach, the first part of the book reviews the subject from the perspective of individual scientific disciplines (hydrology, atmospheric chemistry, geology, soil science, biology and hydrochemistry). The second part shows how these basic concepts can be applied, illustrating a multifaced approach to studies of environmental problems in small catchments around the world. The book summarises the use of this type of research to date, and makes suggestions for the development of future research programmes.
Price: GBP 80.
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Soil Solution Chemistry. Applications to environmental science and agriculture. J.D. Wolt. John Wiley & Sons, Chichester, New York, 1994, xviii + 345 p. ISBN 0-471-58554-8. Cloth.

Soil solution chemistry deserves particular attention as a predictive and diagnostic approach for elucidating bioavailability, mobility, and geochemical cycling of chemicals in soil.

This volume addresses both the applied theory and the methodology of soil solution chemistry. It updates the field with an emphasis on applied problem solving. The book comprises four sections overviewing soil solution chemistry (2 chapters), outlining theory and methodology (4 ch.), addressing general applications (4 ch.), and discussing specific applications of broad interest to environmental scientists and agronomists (4 ch.). Special emphasis is given to environmental science, as this is where the greatest potential for future application of soil solution chemistry will occur.
Price: GBP 66.
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Rock Weathering and Landform Evolution. D.A. Robinson and R.B.G. Williams, editors. John Wiley &

Sons, Chichester, New York, 1994, xxi + 519 p. ISBN 0-471-95119-6. Hardback.

This volume brings together a series of important studies on rock weathering by leading researchers, and illustrates the diversity of approaches and techniques that are currently being used by geomorphologists to study weathering processes and responses.

The book commences with a number of research studies and review chapters on weathering processes and weathered products. This is followed by several discussions of the weathering of cut or dressed rock in urban and coastal environments. Contributors then examine the application of weathering and weathering rates to the dating of deposits or rock surfaces. The final section of the book comprises studies of the relationship between weathering and landforms in a variety of climatic environments.

Price: GBP 85.

Orders to: John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A. *or:* John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England.

Improving the Transfer and Use of Agricultural Information. A guide to information technology. World Bank Discussion Papers 247. W. Zijp. The World Bank, Washington, 1994, viii + 105 p. ISBN 0-8213-2868-9. Paperback.

Information is crucial in agricultural production, in addition to land, labour and capital. However investment in Information Technology (IT) has been mainly in urban areas of industrial countries, despite the potential for cost-effective applications of IT in rural areas in developing countries. Recent developments in IT, that make it particularly relevant for rural development include: reduced costs, increased storage, ease of use, speed, new links between different media, etc. The paper also describes limitations to the application of IT, like the need for complementary inputs, organizational change, improved information management, skills development, human involvement, policy changes, social barriers, and the experimental nature of many technologies. Some pitfalls to be avoided are described.

Furthermore, the paper has ten annexes on particular information technologies, providing task managers with information on what the technology is, how much it costs, what advantages and disadvantages are, and what the requirements are to make it work.

Price: USD 8.95

Orders to: The World Bank, Office of the Publisher, 1818 H Street, N.W., Washington, DC 20433, U.S.A.

Crop Evolution, Adaptation and Yield. L.T. Evans. Cambridge University Press, Cambridge, 1993, xi + 500 p. ISBN 0-521-22571-X. Hardback.

The author provides here an integrated view of the domestication of a wide range of agricultural crops, their adaptation and improvement, bringing together genetic diversity, plant breeding, physiology and aspects of agronomy. Considerations of yield and maximum yield provide continuity throughout the book. Food, feed, fibre, fuel and pharmaceutical crops are all discussed. Cereals, grain legumes and root crops, both temperate and tropical, provide many of the examples, but pasture plants, oilseeds, leafy crops, fruit trees and others are also considered.

After the introductory chapter, the increasing significance of crop yield to the world's food supply is then highlighted. The next chapters consider changes to crop plants over the past ten thousand years (adaptedness to cultivation, adaptation to different environments, and changes involved in the improvement of yield potential).

Trends in yield from early times to the present day are then considered, along with the scope for, and constraints on, further increases. The final chapter on the future of yield hazards some guesses about the way in which agriculture may be transformed over the next fifty years.

Price: GBP 60; USD 95.

Orders to: see below.

Soil Ecology. K. Killham. Cambridge University Press, Cambridge, 1994, xviii + 242 p. ISBN 0-521-43521-8 (Paperback) 0-521-43517-X (Hardback).

This new textbook is meant for all those concerned with the environment. The author meets the increasing challenge faced by environmental scientists, ecologists, agriculturalists and biotechnologists for an integrated approach to soil ecology. The book sets out both fundamental theory and principle to give the reader a thorough grounding in soil ecology, emphasising the interrelations between plants, animals and microbes. The fundamental physical and chemical properties of the soil habitat are set out, enabling the reader to explore and understand the processes of soil nutrient cycling, the ecology of extreme, and polluted soil environments, and the potential of soil biotechnology.

Price: GBP 14.95; USD 24.95 (Paperback). GBP 40; USD 64.95 (Hardback)

Orders to: see below.

An African Savanna. Synthesis of the Nylsvley Study. Cambridge Studies in Applied Ecology and Resource Management. R.J. Scholes and B.H. Walker. Cambridge University Press, Cambridge, 1993, xii + 306 p. ISBN 0-521-41971-9. Hardback.

Savannas cover approximately half of the African land surface and one fifth of that of the world. They are one of the most important, but least studied terrestrial ecosystems. They are the basis of the African livestock industry and the wildlife they support is of key importance in attracting tourists.

The Nylsvley site in South Africa is one of the most intensively studied savannas in the world and, as such, it is a key source of data and theory relating to this important tropical biome. The South African Savanna Biome project was set up to develop the understanding necessary to predict changes in the ecosystem's stability, induced by both natural and man-made stresses. This book provides a synthesis of the programme's sixteen years of research at Nylsvley and aims to develop a unified vision of the ecology of Southern African savannas.

Price: GBP 45; USD 69.95

Orders to: see below.

Riparian Landscapes. Cambridge Studies in Ecology. G.P. Malanson. Cambridge University Press,

Cambridge, 1993, x + 296 p. ISBN 0-521-38431-1. Hardback.

This volume examines the ecological systems of streamside and floodplain areas from the perspective of landscape ecology. The specific spatial pattern of riparian vegetation is seen as a result of, and control on, the ecological, geomorphological, and hydrological processes that operate along rivers.

Riparian structures are controlled by the spatial dynamics of channels, flooding and soil moisture. These dynamics are part of integrated cascades of water, sediment, nutrients and carbon, to which animal and plant species respond in ways that illuminate community structure and competition. The role of the riparian zone in controlling species distribution and abundance is discussed. Intelligent management of these valuable ecological resources is highlighted. The potential for linking hydrological, geomorphological and ecological simulation models is also explored.

Price: GBP 35; USD 59.95.

Orders to: Cambridge University Press, The Edinburgh Building, Cambridge CB2 2RU, England; *or:* Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211, U.S.A.

Soil Erosion, Land Degradation and Social Transition. Advances in Geoecology 27. R.B. Bryan, editor. Catena Verlag, Cremlingen, 1994, vi + 248 p. ISBN 3-923381-36-0. Hardback.

The papers collected in this volume result from research carried out in Baringo District of Kenya to provide basic information essential for land reclamation and development of environmentally and socially appropriate land use practices. Baringo has long been regarded as one of the most severely degraded in Kenya. It was chosen for research because degradation poses an immediate threat to the welfare of the population, and because the district exemplifies many of the environmental problems which have afflicted the Kenyan drylands, and most dryland regions in sub-Saharan Africa. Past attempts to reverse the cycle of environmental deterioration in Baringo have not been very successful, yet most of the ingredients necessary for implementation of environmentally sustainable land use management now appear to be present. With careful and innovative use of the information now available, Baringo could become a model for effective land management in many dryland regions in Africa.

Price: DEM 189; USD 126

Orders to: Catena Verlag, Brockenblick 8, D-38162 Cremlingen-Destedt, Germany; *or:* Catena Verlag, PO Box 1897, Lawrence, KS 66044-8897, U.S.A.

Morphology, Chemistry, Mineralogy and Fertility of Some Acid Sulfate Soils in Sweden. Department of Soil Sciences Reports and Dissertations 18. I. Öborn. Thesis, Swedish University of Agricultural Sciences, Uppsala, 1994, 235 p. ISBN 91-576-4827-1. Paperback.

Acid sulfate soils are known to occur in Asia, West Africa and Northeastern South America, but most soil scientists know much less about their local occurrences in temperate regions. Acid sulfate soils cover 140.000 ha in Sweden (Gyttja soils) and 163.000 ha in Finland. The objective of the thesis was to increase the knowledge about these soils in Sweden, with emphasis on pedology and soil chemistry.

The publication consists of five papers published between 1989 and 1994 and an introductory chapter covering 50 pages, in which seven soil profiles are discussed. Attention was also given to some fertilizer field experiments and the environmental impact of these soils, especially the high surface water discharge of some heavy metals.

Requests to: Dr. Ingrid Öborn, Dept. of Soil Sciences, Swedish University of Soil Sciences, Box 7014, S-750 07 Uppsala, Sweden.

Methodology for Updating Terrain Object Data from Remote Sensing Data. L. Janssen. Thesis, Wageningen Agricultural University. Staring Centre-DLO, Wageningen, 1994, xviii + 173 p. ISBN 90-5485-181-3. Paperback.

This thesis describes some methods for updating the thematic and geometrical data of terrain objects that are contained in a Geographic Information System. The updating is based on the application of digital interpretation techniques on high resolution satellite data.

The underlying idea is that information extraction from remote sensing data (based on digital interpretation techniques) can be improved and optimized by using ancillary data and knowledge about the static and dynamic properties of the terrain objects of interest. Such an approach requires integrated processing of different types of data and knowledge. Important aspects of an integrated approach are the integration level (pixel-based versus object-based data integration), the spatial aspects (co-registration and vector/raster integration) and error propagation.

The terrain objects of interest are agricultural fields. A data set was established consisting of a Landsat TM image and (multi-temporal) data on the crop type and field geometry of agricultural fields in a polder area in the Netherlands. Three updating methods by means of an integrated approach were developed and tested with the available data.

Price: NLG 35

Orders to: L.L.F. Janssen, Leeuweriksweide 194, 6708 LN Wageningen, the Netherlands.

Crop Modeling and Related Environmental Data. CODATA Monograph Series 1. P.F. Uhlir and G.C. Carter, editors. Committee on Data for Science and Technology, Paris, 1994, xiii + 239 p. ISBN 1-884893-01-5 (paperback) 1-884893-00-7 (hardback).

Crop modeling is a valuable and effective multipurpose technique. Its uses can help increase agricultural yields, assist in timely preparations for anticipated crop shortfalls, and improve trade decisions, economic planning, and related policy making. The volume is divided into four sections. The first part provides the technical background with emphasis on the data that are needed to support successful crop modeling applications. Part 2 treats accessibility of global environmental data and selected data integration issues. Part 3 reviews the major issues involved in the effective application of crop models in this specific context and provides some notable examples from sub-Saharan Africa. Part 4 covers the technical, institutional, and

human infrastructure considerations.

The book provides information to assist in the transfer of crop modeling techniques to researchers and agricultural specialists, particularly those working in and with developing countries.

Price: USD 34 (paperback); USD 69 (hardback).

Orders to: CODATA Secretariat, 51 bd. de Montmorency, 75016 Paris, France; *or:* CODATA, c/o E.F. Westrum Jr., Dept. of Chemistry, University of Michigan, Ann Arbor, MI 48109-1055, U.S.A.

Ammonia Exchange Between Crops and Air. Norwegian Journal of Agricultural Sciences 14. L. Holtan-Hartwig and O.Chr. Bøckman. Agricultural University of Norway, Ås, 1994, 41 p. Paperback.

The aim of this study is (1) to describe the principal physiological mechanisms that are involved in ammonium assimilation and formation in plants as a background to the main discussion; (2) to discuss biochemical and physiological factors influencing the ammonia exchange; (3) to survey experimental methods commonly used in the study and quantification of ammonia-uptake and -loss from plant parts above ground; and (4) to review the magnitude of N-losses observed.

Orders to: Agricultural University of Norway, Moerveien 12, N-1432 Ås, Norway.

The Earthscan Reader in Tropical Forestry. S. Rietbergen, editor. Earthscan, London, 1993, ix + 328 p. ISBN 1-85383-127-1. Paperback.

Tropical forests are one of the world's most important resources: they contain the vast majority of its species and play a vital role in the global balance. The unprecedented rate of deforestation over the last fifty years has led to growing concern for the fate of those areas which remain, and for the impact of deforestation on the earth's climate, on biodiversity, and on local people whose livelihoods depend on the forests.

This book draws together a selection of the most important contributions to the discussion, showing the different diagnoses and the various options available for dealing with the problems. The topics covered include policy and management of the forests, land use and degradation, international trade patters and the role of the International Tropical Timber Organization (ITTO), forestry development aid, indigenous peoples and the conservation of biological diversity.

Price: GBP 19.95

Orders to: Earthscan Publications, 120 Pentonville Road, London N1 9JN, England.

Ecology and Landscape Management in Sri Lanka. W. Erdelen, C. Preu, N. Ishwaran and C.M. Maddum Bandara, editors. Margraf Verlag, Weikersheim, 1993, xvii + 623 p. ISBN 3-8236-1182-8. Paperback.

This volume contains the proceedings of the International and Interdisciplinary Symposium held at Colombo in March 1990. The first five days were devoted to the presentation of papers, paralleled with a poster presentation and an exhibition which illustrated the most relevant environmental issues. These presentations covered (1) the ecological context, (2) impact studies and conservation aspects, (3) methodological approaches, (4) the organizational framework, and (5) special evening lectures. After 8 days of field excursions to sites of natural and man-made landscapes and major development project sites in Sri Lanka, the symposium ended with a final session in which the major findings were discussed and summarized, and recommendations for the future were made. These are included in this book

Price: DEM 134

Orders to: see below.

Sustaining Growth. Soil fertility management in tropical smallholdings. K.M. Müller-Sämann and J. Kotschi. Margraf Verlag, Weikersheim, 1994, 486 p. ISBN 3-8236-1226-3. Paperback.

This book presents a range of practices conducive to sustainable agriculture and of particular importance for the development of smallholdings in the tropics. These include agroforestry, intensive fallowing and green manuring, the use of mulch, compost, stable manure, and not least, the purposeful use of natural symbionts. The aim of all these practices is the maintenance of soil fertility using a minimum of external inputs. Much ancient knowledge related to these practices has been forgotten over the years. It is reexamined here, in the light of recent research findings.

Price: DEM 65; USD 46.

Orders to: Margraf Verlag, P.O. Box 105, D-97985 Weikersheim, Germany.

Prediction of the Immediate Effect of Traffic on Field Soil Qualities. P. Lerink. Thesis, Wageningen Agricultural University. Department of Soil Tillage, Wageningen, 1994, 221 p. ISBN 90-5485-267-4. Paperback.

The prediction method is based on a drastic limitation of the domain of prediction: a single field, two traffic systems, and two types of field operations. The effect of compaction by field traffic is expressed by so called soil qualities, i.e. soil physical properties which contain relevant information for the soil user. The soil condition at the time a certain field operation is performed is described by a single soil characteristic only: the gravimetric water content. Field traffic is characterized by the type of field operation and the type of traffic system. These characteristics are further described in terms of the tyre inflation pressure, the wheelload and the number of wheelings. The prediction functions, relating soil and traffic characteristics to the expected effect on soil qualities are established by means of a comparative method, and based on laboratory measurements on field compacted soil. The prediction functions are presented by means of extended M-P-V diagrams.

Orders to: Department of Soil Tillage, Wageningen Agricultural University, Diedenweg 20, 6703 GW Wageningen, the Netherlands.

Capacidad de Uso Y Erosión de Suelos. Una aproximación a la evaluación de tierras en Andalucía. J.M. Moreira Madueño. Agencia de Medio Ambiente, Sevilla, 1991, 446 p. + 1 mapa. ISBN 84-87294-18-9. Hardcover.

Esta publicación constituye un resumen de la tesis doctoral del autor titulada "La erosión de los suelos en el valle central del río Guadalquivir. Su influencia en el uso y la gestión de la tierra", presentada en la Facultad

Geografía e Historia de la Universidad de Sevilla, en 1989. El estudio constituye una importante aportación al conocimiento de la problematica de la erosión en Andalucía, ya que establece una metodología de evaluación de recursos acorde con los pricipios recomendados por organismos como la F.A.O. e incorporando una división jerarquizada de unidades de tierra. Igualmente, supone una aproximación al análisis de la capacidad de uso de las tierras de Andalucía y la influencia que las diferentes alternativas de uso y gestión de las mismas tiene en la degradación por erosión de los suelos.

El levantamiento de información y elaboración de modelos, desarrollado por el autor para este trabajo, es *un pilar fundamental del Sistema de información ambiental* de Andalucía (SinambA), convirtiéndose este documento en un instrumento básico para la planificación y la gestión medioambiental de la región.
Orders to: Junta de Andalucia, Agencia de Medio Ambiente, PO Box 1052, E-41080 Sevilla, España.

Groundwater: Drought, Pollution and Management. C. Reeve and J. Watts, editors. A.A. Balkema, Rotterdam, Brookfield, 1994, xi + 264 p. ISBN 90-5410-351-5. Hardback.

This volume looks at issues arising from the increasing international concern over the long term sustainability of groundwater resources. The problems of overexploitation, pollution and drought are examined as are also some of the remedial and management strategies that engineers and researchers are developing to combat these medium and long term problems. In this connection recent innovative developments and applications of artificial recharge techniques are discussed. Other environmental, economic and regulatory considerations facing groundwater planners, managers and researchers working in both the developed and developing world are also covered.
Price: NLG 170
Orders to: see below.

Engineering Characteristics of Arid Soils. P.G. Fookes and R.H.G. Parry, editors. A.A. Balkema, Rotterdam, Brookfield, 1994, x + 441 p. ISBN 90-5410-365-5. Hardback.

Arid soils cover more than one-third of the world's land surface. Many of them have unique characteristics which, under unfavourable circumstances, can pose difficult geotechnical problems arising from collapse, swelling, softening, erosion or chemical attack on engineering structures. The nature of these soils, together in some cases with high pore water suctions, can greatly influence their behaviour. Changes in groundwater conditions can have catastrophic effects.

The spread of desertification and the ever increasing use and exploitation of arid lands has spurred the need for greater geotechnical understanding of these soils. The unique character of arid soils has demanded new soil mechanics thinking and new methods of research and investigation, as evidenced by the papers in this volume. They also illustrate how vital civil engineering and building works can be implemented in these areas, while maintaining a strong awareness of the need for proper environmental management.

This volume contains the Proceedings of the 1st International Symposium on Engineering Characteristics of Arid Soils. The contributions are grouped under the following topics: (a) arid environments and descriptions of arid soils; (b) classification of arid soils; (c) engineering behaviour and properties of arid soils; and (d) case histories of construction and field investigation in arid soils.
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Publishers, Old Post Road, Brookfield, VT 05036, U.S.A.

***Conserving Soil Moisture and Fertility in the* Warm Seasonally Dry Tropics.** World Bank Technical Paper 221. J.P. Srivastava, P.M. Tamboli, J.C. English, R. Lal and B.A. Stewart. The World Bank, Washington, 1993, x + 81 p. ISBN 0-8213-2617-1. Paperback.

This paper examines ways to achieve sustainable agricultural development in dry tropical regions. It focuses on ways to make each unit of land more productive. This approach helps safeguard fragile lands, maintain biodiversity, and reduce pollution and deforestation. Warm seasonally dry tropics suffer from little rainfall, extensive environmental damage, and scant natural resources.

The authors show how to manage land under such conditions, how to clear land and sow crops early with viable seed, and how to use cover crops and select cropping systems. Fertilizer strategies are also discussed. They survey changes in current practice that can reduce fertilizer losses. The study explains how to harvest water and use small catchments and supplemental irrigation. It describes how to minimize erosion by water and wind. Topics include mulch farming, conservation tillage, windbreaks, and soil coverage with non-erodible materials.
Price: USD 7.95
Orders to: see below.

Modern Water Control in Irrigation. World Bank Technical Paper 246. H. Plusquellec, C. Burt and H.W. Wolter. The World Bank, Washington, 1994, xi + 98 p. ISBN 0-8213-2819-0. Paperback.

This paper deals with the challenge of system modernization. New design concepts and modern technologies already exist and have proven their usefulness in many schemes around the world. What is now required is that these concepts and technologies be assessed and utilized on a larger scale. This publication, which is the first of the new World Bank Irrigation and Drainage Series, is intended to stimulate debate among professionals and to increase awareness of the potential of modern technologies for water control and sustainable irrigated agriculture.
Price: USD 8.95
Orders to: see below.

Agricultural Extension. A Step beyond the Next Step. World Bank Technical Paper 247. C. Ameur. The World Bank, Washington, 1994, viii + 34 p. ISBN 0-8213-2843-3. Paperback.

Governments often lack a clear strategy for exten-

sion. It is now recognized that in most cases a single extension system may not be the only option. Rather, there is a need for flexibility and the adoption of multiple approaches to extension. Another key point made in the paper is that extension must evolve rapidly if it is to survive. Extension services continue to be provided in most countries by the public sector while farmers play a rather passive uncommitted role. Given the high recurrent costs involved, this situation cannot be sustained for long.

Sooner or later, countries will, in increasing number, have to divest themselves from extension services and the supply of agricultural inputs. When this happens, most responsibilities for extension should gradually and to the extent possible, be handed over to the private sector. Meanwhile, the public sector is likely to retain a certain role in agricultural extension, a role that needs to be redefined.
Price: USD 6.95
Orders to: see below.

Indigenous Views of Land and the Environment. World Bank Discussion Papers 188. S.H. Davis, editor. The World Bank, Washington, 1993, xi + 91 p. ISBN 0-8213-2327-X. Paperback.

The world's remaining indigenous peoples – estimated at over 250 million people in 70 countries – possess sophisticated knowledge that could yield solutions to successful management and development of the land not only in their regions but elsewhere as well. This paper reports on four such groups: the Quichua of eastern Ecuador, the Masai and the Sumburu of Kenya, and the tribal peoples of the Philippines. Researchers found a close attachment to and reverence for the land among these peoples. They also found that these indigenous groups continue to have difficulty in securing official recognition of their rights to traditional lands.

This paper highlights the desire of indigenous peoples to play a part in the plans for their lands. It maintains that it is in all our interests to include indigenous peoples in the debate about development and the environment.
Price: USD 7.95
Orders to: see below.

World Development Report 1994: Infrastructure for Development. Oxford University Press, Oxford, New York, 1994, 264 p. ISBN 0-19-520992-3 (Paperback) 0-19-520991-5 (Hardcover).

The report focuses on services that are essential for households, business, and governments to function – transport, telecommunications, water and sanitation, power and gas, and major water works. Infrastructure is one of the areas in which government policy and finance have an important role to play because of its pervasive impact on economic development and human welfare. This report presents new strategies for developing infrastructure in more effective, less wasteful ways. It shows that the *quantity* of investment cannot be the exclusive focus of policy. It is also vital that the *quality* of infrastructure service be improved.

The report considers new ways of meeting public needs for services from infrastructure – ways that are more efficient, more user-responsive, more environmentally friendly, and more resourceful in using both the public and private sectors.
Price: USD 19.95 (paperback); USD 37.95 (hardcover). Executive summary free of charge on request.
Orders to: The World Bank, Office of the Publisher, 1818 H Street, N.W., Washington, DC 20433, U.S.A.

Carbon Cycling in Boreal Peatlands and Climate Change. *Special Issue of SUO Mires and Peat, Vol. 43* N° 4-5, 1992. H. Vasander and M. Starr, editors. Finnish Peatland Society, Helsinki, 1993, 181 p. ISSN 0039-5471. Paperback.

This volume contains the proceedings of an International Workshop. The aims of the workshop were: (1) to present the latest information and results concerned with the role of carbon cycling in natural and managed peatlands in relation to predicted climate change and (2) to give Finnish scientists the opportunity to discuss their research with international experts and so make improvements in the second phase of the Finnish project on "Carbon Balance of Peatlands and Climate Change".
Orders to: Dr. H. Vasander, Dept. of Peatland Forestry, University of Helsinki, Unioninkatu 40 B, SF-00170 Helsinki, Finland.

Proceedings of the International Symposium on Strategies for Utilizing Salt Affected Lands. L. Moncharoen, chairman Edit. Comm. x + 586 p. Paperback.

This volume contains the proceedings of the International Symposium of the Subcommission on Salt-Affected Soils of the ISSS held in February 1992 in Bangkok, Thailand. This symposium was set to achieve the following: (1) bring together international and interdisciplinary scientists specializing in fields related to the utilization of salt affected lands; (2) provide a forum for scientists to present their research findings related to salt affected lands; (3) exchange opinions and experiences relating to salinity control and the utilization of salt affected lands; and (4) adapt up-to-date technology and promote technology transfer between the various disciplines and countries.

The papers were presented in one poster session and seven technical sessions: General session; Genesis, characteristic and mapping techniques; Use of saline water for irrigation; Management of salt affected land; Ecology and environment; Salt tolerance of crops and management; and Halophytes. The book contains also summaries of the technical sessions.
Price: USD 40
Orders to: The Agricultural Science Society of Thailand, PO Box 1070, Kasetsart University, Bangkok 10903, Thailand.

Nitrogen Use Efficiency in Intensive Grassland Farming. P.J.A.G. Deenen. Doctoral Thesis, Department of Agronomy, Agricultural University, Wageningen, 1994, vii + 140 p. ISBN 90-5485-270-4. Paperback.

This thesis describes the effects of fertilizer nitrogen on herbage yield under rotational and continuous grazing of perennial ryegrass swards with beef cattle and dairy cows, and under cutting only on both a sand and a silty loam soil. Furthermore, effects are described of nitrogen input and grassland management on yield of

perennial ryegrass swards after severe winters on both soils and the effects of dung and artificial urine on nitrogen uptake and herbage accumulation on a sand soil.
Orders to: Department of Agronomy, Agricultural University, PO Box 341, 6700 AH Wageningen, the Netherlands.

Méthodes Multicritäres ELECTRE. Collection Gérer l'Environnement 8. L.Y. Maystre, J. Pictet et J. Simos. Presses Polytechniques et Universitaires Romandes, Lausanne, 1994, xiv + 323. Broché.

Ce livre, s'adressant à des non-mathématiciens, met à leur portée toute la gamme des méthodes ELECTRE en les situant dans le cadre général de l'aide multicritère à la décision. Il insiste sur l'importance et sur la manière de conduire des analyses de robustesse prenant appui sur des analyses de sensibilité. Dans ce livre, un même problème est utilisé pour illustrer pas à pas les divers aspects théoriques de chaque méthode utilisée, et des conseils pratiques relatifs à la manière d'exploiter ces méthodes sont amplement développées.

Les deux premières parties constituent une initiation aux méthodes ELECTRE et à leur emploi dans toute leur généralité. La troisième partie présente de façon détaillée plusieurs cas d'application concrets de ces méthodes, qui permettent de bien comprendre la manière dont elles peuvent s'insérer dans un processus de décision réel. Ce livre insiste plutôt sur le comment que sur le pourquoi. Il présente néanmoins les principaux concepts de base de l'aide multicritère à la décision (critères, seuils de discrimination, concordance, seuils de veto, discordance, surclassement, problématique, ...).
Price: SFR 82
Orders to: Presses Polytechniques et Universitaires Romandes, EPFL-Centre Midi, CH-1015 Lausanne, Switzerland.

Studies in Arid Land Management. T.S. Chouhan and K.N. Joshi, editors. Scientific Publishers, Jodhpur, 1993, xiv + 432 p. ISBN 81-7233-064-2. Hardback.

The present volume has been divided into four main sections. The first section deals with the geographical setting. It contains 7 articles, starting with the genesis and spread of Indian deserts, followed by delimitation of climatic zones, present status of desertification and geographical appraisal of arid lands in the Indian context. This section is closed with a discussion about famines and droughts in the region. The second section relating to plant and animal resource management describes its phytogeography and other aspects like medicinal flora and eco-development of the Thar desert. In the end, it attempts to highlight the concentration and distribution pattern of livestock.

The third section concentrates on land, water and agricultural resource management. It includes river water resources, irrigation, particularly canal irrigation, and many articles on agricultural phenomena. The fourth and last section concerns the human resource management. It deals with the dairy industry and industry in general, population pressure and settlement, socio-economic impact and foodgrains, nutritional deficiency and environmental hazards in open cast mining in arid lands.
Orders to: Scientific Publishers, PO Box 91, Jodhpur 342001, India.

Geomorphology in the Tropics. M.F. Thomas. John Wiley & Sons, Chichester, New York, 1994, xxi + 460 p. ISBN 0-471-93035-0. Hardback.

It may be argued that earth surface processes are the same throughout the world, the only difference being the intensity with which they operate. However, in many branches of study, it has been a tradition to consider the humid tropics as a separate region because of prevailing high temperatures and lack of limitations of moisture. One of the most thorough discussions of weathering yet seen in a geomorphology textbook is included and the significance of the inter-relationship between geomorphology and soils recurs throughout the book.

Weathering leads logically to a consideration of the nature of the regolith, including a discussion of laterites, bauxites and duricrusts. Chapters follow on the physical and chemical processes which sculpt the earth's surface, the effects of which may be seen in erosion, landsliding and other mass-movements. In sympathy with current concern for climatic change, the author devotes two chapters to geomorphological studies in the tropical regions which have contributed to an understanding of past climatic change. The final section is devoted to an analysis of the evolution of tropical landscapes, a subject upon which the author has published widely.

This book is of relevance to all soil scientists (not just in the tropical regions) as the geomorphological history of the landscape can tell much about the origin, age, nature and distribution of soil parent materials. With around 1200 references, it will also be of great help to students and others with an interest in tropical landscapes. The text contains numerous black and white illustrations and 23 colour photographs. This is a book which should be on the shelves of all geomorphologists and soil scientists, especially those with tropical interests; however when they see the price of the hardback edition reviewed, they may well await a more competitively priced paperback version. Michael Thomas ends his comprehensive account with the statement that the starting point for future advances in geomorphological research must be the present state-of-the-art. This has been presented for the reader in a lucid and attractive manner.

E.M. Bridges, Wageningen, The Netherlands.
Price: GBP 85, USD 136
Orders to: see below.

Environmental Change in Drylands. Biogeographical and geomorphological perspectives. A.C. Millington and K. Pye, editors. John Wiley & Sons, Chichester, New York, 1994, xvi + 456 p. ISBN 0-471-94267-7. Hardback.

This volume deals with the ecological and geomorphological responses to both climate and anthropogenically-induced change in drylands. Change in both processes and the resulting forms (i.e. landforms and plant communities) is covered. An important element of the studies presented is the link between vegetation responses to eternal change and the functioning of geo-

morphological processes.

This publication, based on a symposium organised by the Biogeography Research Group and the British Geomorphological Research Group, continues the current trend of analyzing recent palaeoenvironmental change in order to understand and to control present-day systems. Examples of dryland evolution are presented from the Kalahari, California, North West and North East Africa, Australia, southern Europe and China.

Price: GBP 65, USD 104

Orders to: see below.

Toxic Metals in Soil-Plant Systems. S.M. Ross, editor. John Wiley & Sons, Chichester, New York, 1994, xiv + 469 p. ISBN 0-471-94279-0. Hardback.

While not all metals in soil-plant systems are inherently toxic, particularly in low concentrations, there is an increasing incidence of metal pollution from aerial fallout, spoils, wastes and agricultural amendments including sewage sludge. This book discusses the processes of trace-metal cycling in contaminated ecosystems under conditions where their concentrations become toxic through high loading rates, long-term exposure or altered environmental conditions. Other environmental and pedological concentration mechanisms are discussed, including cation exchange and anion adsorption onto different soil materials.

The book is divided into two sections. The first part discusses the sources and fates of metals in ecosystems, with an up-to-date review of the processes which control metal speciation in soils, metal uptake mechanisms, and plant responses to toxic metal concentrations in soils. In the second part, a selection of case studies is presented which discuss metal toxicities and metal cycling in a range of different ecosystems, including managed agricultural systems, deciduous woodland, upland heather moorland, and tropical wetlands.

Price: GBP 55, USD 88

Orders to: see below.

Environmental Remote Sensing from Regional to Global Scales. G. Foody and P. Curran. John Wiley & Sons, Chichester, New York, 1994, xii + 238 p. ISBN 0-471-94434-3. Hardback.

Remote sensing by satellites provides scientists with powerful means of analyzing the terrestrial environment in fields as diverse as meteorology, agriculture, town planning or ecology. Allied to the powerful computer-based methodologies of Geographic Information Systems and image processing and cartographic techniques, perhaps its most important aspect is the way Environment Remote Sensing (ERS) can allow synoptic interpretation of complex geographical phenomena from global to local scales. This book provides papers demonstrating the flexibility and power of ERS techniques in a variety of contexts and scales. To achieve this end, a group of specialists have been invited to contribute surveys of the field. A high level of technical expertise is not required, making the book accessible to the research scientist, or student or professional wishing to assess the application of these techniques to his/her own field of study.

Price: GBP 55, USD 88.

Orders to: see below.

More People, Less Erosion. Environmental recovery in Kenya. M. Tiffen, M. Mortimore and F. Gichuki. John Wiley & Sons, Chichester, New York, 1994, xii + 311 p. ISBN 0-471-94143-3. Paperback.

This interesting volume examines the interactions between people and the environment of the semi-arid Machakos District, Kenya, between 1930 and 1990. Over this period, the population of the district increased more than five-fold, however the environment in 1990 was in a much better condition than in the 1930s. Soil erosion had declined, due to terraces in place to protect arable land, and predictions of a wood fuel crisis were not fulfilled because of a larger number of farmed and protected trees. Additionally, agricultural production per person and per hectare was higher, and new technologies and farming systems had been introduced, responding to better contacts with markets and more sources of information.

This study combines the findings of physical and social scientists. It uses conventional data, oral history and photographic records. A unique feature is a series of photographs of the same sites taken in 1937 and 1990. This study concludes with an explanation of the positive contribution that population growth in low density areas can have on economic and social development, technology change and environmental sustainability, under the right policies.

Price: GBP 22.50, USD 36.50

Orders to: John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A. *or:* John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England.

Histoire de la Géologie. Tome 2: 1660-1810. F. Ellenberger. Technique et Documentation (Lavoisier), Paris, 1994, xiv + 383 p. ISBN 2-85206-674-2. Cartonné.

Le second tome de cet ouvrage décrit la constitution d'une Science essentielle directement liée à la découverte de l'immense passé de la Terre et de son histoire mouvementée: l'Homme Occidental a soudain pris conscience de n'être que le dernier "avatar" de ce mouvement!

L'auteur s'appuie sur une recherche documentaire, puisée aux sources originales, pour dresser un panorama de la Géologie depuis ses origines. Ce livre présente également les grands noms de cette discipline, leurs grandes découvertes, les méthodes successives et les analyse pour nous permettre de comprendre la Géologie d'aujourd'hui.

Prix: FF 225

Commandes à: Librairie Lavoisier, 14 rue de Provigny, F-94236 Cachan Cedex, France.

Multiple Use of Rangelands within Agropastoral Systems in Southern Mali. S. Leloup. Doctoral Thesis, Wageningen Agricultural University, Wageningen, 1994, x + 101 p. ISBN 90-5485-271-2. Paperback.

The communal rangelands in southern Mali constitute important grazing areas, provide fruit, timber and fuel and protect the cultivated fields against run off. During recent decades the rangelands experienced increased pressure caused by periods of droughts, growth of the human and livestock population and an

encroached cropping system. This thesis focuses on various aspects of relevance to the condition of the rangelands. The main findings were: 1) the condition of the rangelands with regard to their multiple functions has declined since recent decades, 2) animal productivity is increasingly dependent on the cropping system and 3) the influence of the cropping system on animal productivity leads to a deterioration of the rangelands.
Orders to: Department of Agronomy, Wageningen Agricultural University, PO Box 341, 6700 AH Wageningen, the Netherlands.

Soil Compaction in Crop Production. Developments *in Agricultural Engineering 11.* B.D. Soane and C. van Ouwerkerk, editors. Elsevier Science Publishers, Amsterdam, New York, 1994, xvii + 662 p. ISBN 0-444-88286-3. Hardback.

This book provides a global review of the mechanisms, incidence and control measures related to the problems of soil compaction in agriculture, forestry and other cropping systems. Among the disciplines which relate to this subject are soil physics, soil mechanics, vehicle mechanics, agricultural engineering, plant physiology, agronomy, pedology, climatology and economics.

Apart from the Introduction and Conclusion papers by the editors, the 24 papers included in this book are organized in the following parts: Soil-vehicle mechanics (3 papers); Effects of compaction on soil properties (6 papers); Mechanisms and incidence of crop responses to soil compaction (6 papers); Vehicle and traffic systems in crop production (6 papers); Economic aspects of soil compaction and its control (3 papers). Recommendations for further research on this important topic are also given.
Price: NLG 440; USD 251.50
Orders to: see below.

Humic Substances in the Global Environment and Implications on Human Health. N. Senesi and T.M. Miano, editors. Elsevier Science Publishers, Amsterdam, New York, 1994, xxi + 1368 p. ISBN 0-444-89593-0. Hardback.

The International Humic Substances Society (IHSS) was founded in 1981 with the purpose of advancing the knowledge, research and applications of humic substances in the global environment and providing an international forum for exchange, communication and cooperation among soil, water and sediment scientists with interests in humic substances.

This volume presents the Proceedings of the 6th IHSS Meeting, held in Italy in September 1992. Individual chapters are based on invited lectures and volunteered oral and poster papers that were presented at the meeting. The invited articles provide an overview of the state of the art in different areas of the studies of humic substances. The volunteered, peer reviewed, articles present original results on advancements in the fundamental aspects of the chemistry and biochemistry of humic substances and their applications in agriculture, industry and medicine, and in the interactions of humic substances with environmental inorganic and organic species and organisms in soil, aquatic, and sedimentary systems.

The papers, which form this book with extensive information, are arranged in 5 sections: (1) Advances in the chemistry and biochemistry of humic substances: isolation, characterization, functions (49 papers); (2) Humic substance in soil and crop production (50 papers); (3) Humic substances in aquatic and sedimentary systems (25 papers); (4) Interactions of humic substances with organic and inorganic xenobiotics and with organisms (36 papers); and (5) Applicative aspects of humic substances: industrial and medical issues (21 papers).
Price: NLG 625.
Orders to: in the USA and Canada: Elsevier Science Publishing Co. Inc., P.O.Box 945, Madison Square Station, New York, NY 10160-0757, USA; *Elsewhere:* Elsevier Science Publishers, P.O.Box 211, 1000 AE Amsterdam, the Netherlands.

Escaping from Hunger. ACIAR Monograph 23. B. Lee. Australian Centre for International Agricultural Research (ACIAR), Canberra, 1993, 52 p. ISBN 1-86320-093-2. Paperback.

From 1984 to 1993, ACIAR funded a project in which Kenyan and Australian scientists sought ways to address the many problems encountered by farmers living in Kenya's semi-arid rural areas. Over time production from their farms has fallen and continues to fall, with many farmers sliding into poverty as their land becomes less fertile. This booklet contains ideas that may at last help farmers to slow or even stop the fall in food production. The ideas should also assist farmers in other semi-arid parts of Africa.
Price: AUD 25 for HDC, free of charge for LDC.
Orders to: ACIAR, GPO Box 1571, Canberra, ACT 2601, Australia.

Atmospheric Methane: Sources, Sinks, and Role in Global Change. NATO ASI Series: Global Environmental Change 13. M.A.K. Khalil, editor. Springer-Verlag, Heidelberg, New York, 1993, ix + 561 p. ISBN 3-540-54584-0 (German edition) 0-387-54584-0 (US edition). Hardcover.

Methane plays many important roles in the earth's environment. It is a potent "greenhouse gas" that warms the earth; controls the oxidizing capacity of the atmosphere (OH) indirectly affecting the cycles and abundances of many atmospheric trace gases; provides water vapour to the stratosphere; scavenges chlorine atoms from the stratosphere, terminating the catalytic ozone destruction by chlorine atoms, including the chlorine released from the man-made chlorofluorocarbons; produces ozone, CO, and CO_2 in the troposphere; and it is an index of life on earth and so is present in greater quantities during warm interglacial epochs and dwindles to low levels during the cold of ice ages. By all measures, methane is the second only to CO_2 in causing future global warming.

The book presents an account of the current understanding of atmospheric methane, and it summarizes more than a decade of intensive research on the global sources, sinks, concentrations, and environmental role of methane.
Price: DME 328; ATS 2558.40; CHF 322; USD 226.
Orders to: see below.

Handbook for Rhizobia: Methods in Legume-Rhizobium Technology. P. Somasegaran and H.J. Hoben. Springer Verlag, Heidelberg, New York, 1994, xvi + 450 p. ISBN 3-540-94134-7 (German edition) 0-387-94134-7 (US edition). Hardcover.

Rhizobia are soil bacteria which form nodules on the roots of leguminous plants. During their symbiotic association in the nodules, they bring about biological nitrogen fixation. The interaction between rhizobia and plants is of enormous agricultural significance and has bene studied intensively at the physiological, cellular, and molecular levels. This book is a compendium of methods for working with rhizobia and their interactions with the host legume. It includes dozens of detailed protocols on topics ranging from isolation and maintenance of rhizobia to contemporary molecular biology methods, and is divided into five sections: 1) Microbiology of rhizobia, including isolation, characterization, and enumeration; 2) Strain identification by serological methods, antibiotic markers, and rhizobiophages; 3) Evaluating the nitrogen-fixing potential of rhizobia under greenhouse and field conditions; 4) Mass culture techniques for rhizobia, including fermentor-based culture and the production of carrier-based inoculants; and 5) Molecular biology methods for rhizobia.
Price: DME 148; ATS 1154.40; CHF 148.
Orders to: Springer-Verlag, Tiergartenstrasse 17, D-69121 Heidelberg, *or:* Springer-Verlag, 175 Fifth Avenue, New York, NY 10010, U.S.A.

Mijikenda Agriculture in Coast Province of Kenya. H. Waaijenberg. Doctoral Thesis, Wageningen Agricultural University. Royal Tropical Institute, Amsterdam, 1994, x + 308 p. ISBN 90-6832-089-0. Paperback.

The Mijikenda live in the hinterland of the southern Kenya coast. They are peasants with small farms and low yields of crops and livestock. They are generally considered to be traditionalists who are reluctant to adapt their society and agriculture to the ways of tomorrow. In this thesis, the author describes and analyses present Mijikenda agriculture, to identify bottlenecks limiting its performance and look for possibilities for future development. The study combines a farming systems approach with awareness of the constraints imposed by ecological conditions, plus the role of historical processes in shaping today's reality.
Price: NLG 65.
Orders to: Royal Tropical Institute, Mauritskade 63, 1092 AD Amsterdam, the Netherlands.

Bodenkunde. 5. Auflage. H. Kuntze, G. Roeschmann und G. Schwerdtfeger. Verlag Eugen Ulmer, Stuttgart, 1994, 424 S. ISBN 3-8252-8076-4.

In diesem Lehrbuch ist der gegenwärtige Stand des bodenkundlichen Wissens und seine Anwendung dargestellt. Aufbauend auf einer gerafften Darstellung der geowissenschaftlichen Grundlagen und der Bodenphysik, -chemie und -biologie sind die Entstehung und Entwicklung der Böden sowie ihre Eigenschaften beschrieben.

Im Abschnitt Bodentechnologie steht der Bodenschutz als wichtiger Teil des Umweltschutzes im Mittelpunkt. In der neubearbeiteten und erweiterten fünften Auflage wurden die in den neuen Bundesländern üblichen Bodengliederungen in den Abschnitten Bodensystematik und Bodenarten berücksichtigt. Das Lehrbuch bietet einen thematischen Einstieg für alle, die in den Bereichen Agrar- und Forstwissenschaft, Gartenbau und Landespflege, Geographie, Geobotanik und Geodäsie, Wasserwirtschaft und Kulturtechnik tätig sind.
Preis: DEM 58
Bestellungen an: Verlag Eugen Ulmer, Postfach 700561, D-70574 Stuttgart, Deutschland.

Land and Soil Management: Technology, Economics and Institutions. A. Sfeir-Younis and A.K. Dragun. Westview Press, Boulder, Oxford and Oxford & IBH Publishing, New Delhi, 1993, xiv + 309 p. ISBN 0-8133-8733-7. Cloth.

This book provides analytical frameworks to guide the creation and appraisal of soil erosion control programs. The authors discuss a broad range of important issues involved in designing and implementing more effective soil conservation programs. The book begins with a discussion of the physical and economic dimensions of soil erosion and an estimation of the extent of the problem. It then explains how to improve the evaluation of soil conservation programs by integrating scientific knowledge with economic methods and procedures. A series of practical illustrations graphically demonstrates the application of the concepts derived from the theory.

The most important organizational, institutional, technical, and macroeconomic aspects of soil and land management appraisal are outlined, and the major elements of projects or program design are also pinpointed and illustrated. Finally, the book suggests areas most in need of future research.
Price: USD 67.50, GBP 48.50
Orders to: Westview Press, Inc., 5500 Central Avenue, Boulder, CO 80301, U.S.A.; *or:* Westview Press, 36 Lonsdale Road, Summertown, Oxford OX2 7EW, England.

Indirect Methods for Estimating the Hydraulic Properties of Unsaturated Soils. M.Th. Van Genuchten, F.J. Leij and L.J. Lund. University of California, Riverside, 1992, xi + 718 p. Hardback.

This publication is the result of an international workshop held at Riverside, California, in October 1989. The workshop was designed to evaluate the current state-of-the-art in estimating the unsaturated hydraulic properties from more easily measured soil data, such as soil texture, bulk density, organic matter content, or soil water retention data. The hydraulic properties are probably the most important parameters affecting the rate of water flow and chemical transport in soil. While direct measurement of the hydraulic properties is increasingly viewed impractical or uneconomical for most applications, indirect methods have evolved to the point where they seem to provide reliable answers for many problems.
Price: USD 40 (incl. shipping and handling)
Orders to: Prof. M.Th. van Genuchten, U.S. Salinity Laboratory, 4500 Glenwood Drive, Riverside, CA 92501, U.S.A.

Population and Land Use in Developing Countries. C.L. Jolly and B. Boyle Torrey, editors. National Academy Press, Washington, 1993, xi + 159 p. ISBN 0-309-04838-9. Paperback.

This report summarizes the discussions and papers presented at a Committee on Population workshop on population growth and land use change in developing countries. The workshop, held in December 1991 in Washington, brought together researchers from different disciplines to discuss recent research on the effects of population growth on land use. Approximately half of the workshop was devoted to general aspects of the topic: the history of land use change; the measurement of land use change; approaches to the study of population growth and land use; population-induced technological change in agriculture; the use of cross-national data to understand population and land use relationships; and institutional change. Because ecological, economic, demographic, and institutional conditions vary from place to place, the rest of the workshop focused on case studies, which exhibited a variety of analytical strategies for studying the population and land use relationship. Summary versions of some of the papers are published in this report.
Price: GBP 21.95
Orders to: National Academy Press, 36 Lonsdale Road, Summertown, Oxford OX2 7EW, England; *or:* National Academy Press, 2101 Constitution Avenue, N.W., Washington DC 20418, U.S.A.

Contribution à l'Etude de l'Environnement et de la Dynamique des Mangroves de Guinée. Etudes et Thèses. F. Bertrand. Editions de l'ORSTOM, Paris, 1993, 201 p. ISBN 2-7099-1150-7. Broché.

Le recul spectaculaire de certaines formations végétales de front de mer a révélé l'instabilité particulière des mangroves guinéennes et montré l'urgence d'une meilleure connaissance de cet écosystème hautement productif, en vue d'un développement durable. Après avoir défini les fondements d'une classification des mangroves guinéennes à partir de la perception des paysages au sol, l'auteur a fait appel aux données de télédétection satellitaire qui offrent à l'heure actuelle les meilleurs qualités de résolution spectrale pour cartographier ces paysages dans la totalité de leur étendue. La seconde partie de ce travail est ainsi réservée à une évaluation de l'apport des données SPOT pour la classification des mangroves.

L'auteur souhaite démontrer, à partir de l'exemple guinéen, que l'utilisation conjointe des données satellitaires et de l'analyse de terrain peut permettre de concilier les impératifs d'une gestion planifiée des ressources de la mangrove et le souci d'une préservation long terme de cet écosystème particulièrement fragile.
Prix: FFR 250
Commandes à: voir ci-dessous.

Amélioration du Régime Hydrique des Sols Dégradés en vue de leur Réhabilitation. Cas des vertisols du Nord-Cameroun. Travaux et Documents Microfichés 97. D. Masse. Editions de l'ORSTOM, Paris, 1993, 2 microfiches. ISBN 2-7099-1137-X.

L'objectif de ce travail est d'étudier l'amélioration du régime hydrique de vertisols dégradés dans les régions semi-arides du Cameroun. La dégradation des vertisols est caractérisée par un dysfonctionnement hydrique consécutif à des modifications structurales des horizons de surface. Les pratiques testées concernent des petits aménagements hydro-agricoles de type pitting, bandes alternées, microcatchment ou casiers, auxquels sont associées certaines façons culturales comme le labour ou le buttage.

Une meilleur compréhension du fonctionnement hydrique des vertisols dégradés a permis de présenter une modélisation des termes de pluviosité. Enfin, à partir de ces résultat et des expériences diverses réalisées sur les vertisols, l'auteur propose une réflexion sur la réhabilitation et l'aménagement des vertisols dégradés du Nord-Cameroun.
Prix: FFR 25
Commandes à: Editions de l'ORSTOM, 70 route d'Aulnay, F-93143 Bondy Cedex, France.

Réseau Erosion. Numéro Spécial consacré à la 10è Réunion du Réseau Erosion. Bulletin No 14. ORSTOM, Paris, 1994, 624 p.

L'une des premières vocations du Réseau Erosion étant de donner la parole aux différents acteurs intéressés par les problèmes d'érosion et de conservation des sols, ce numéro contient toutes les communications présentées au cours de la dernière réunion (Xème anniversaire du Réseau), sur le thème de "La Contribution de l'Agroforesterie et de l'Elevage à la Restauration des Sols". Les communications sont réparties de façon suivante: (1) Dégradation, Erosion et Restauration des Sols (22 comm.); (2) Contribution de l'agroforesterie à la restauration des sols (16 comm.); et (3) Contribution de l'élevage à la restauration des sols (10 comm.).
Commandes à: Centre ORSTOM de Montpellier, BP 5045, 34032 Montpellier Cedex 1, France.

Agriculture and the Environment. Environmental Management, Science and Technology. J.G. Jones, editor. Ellis Horwood, New York, London, 1993, vii + 200 p. ISBN 0-13-065863-4. Hardback.

This book presents papers on the conflict between agriculturalists and environmentalists regarding the development of intensive farming practices and the use of modern fertilizers and other chemicals. It consists of fourteen papers presented at a Symposium and addresses the farmer's need for agricultural chemicals; the prevention of water pollution in manufacture and use of agrochemicals; agricultural utilization of sewage sludge; contamination of groundwaters from farming activities; farm waste pollution; farm waste and nitrate pollution; the impact of intensive dairy farming on river quality; the agricultural requirements for water; water requirements for fish farming; pollution from fish farms; water source protection and protection zones; land drainage; river engineering; and set-aside and extensification of agricultural production.
Price: USD 76.50
Orders to: Ellis Horwood Ltd., Market Cross House, Cooper Street, Chichester, West Sussex PO19 1EB, U.K.

Laterites: Concepts, geology, morphology and chemistry. Compiled by G.J.J. Aleva, edited by D. Creutzberg. International Soil Reference and Information Centre (ISRIC), Wageningen, and the European

Commission, Brussels, 1994, 169 p. ISBN 90-6672-053-0. Paperback.

At the Second Seminar of the Unesco-sponsored IGCP-129 Project held in S,o Paulo in 1982, the need was expressed for standardization of terms used in the description of laterite characteristics. On that occasion, the idea to make a collection of laterite profiles for interdisciplinary use was put forward. This world collection was later termed International Collection of Reference Laterite Profiles (CORLAT) and would be built up at ISRIC. It was also recommended that, for interdisciplinary use, guidelines should be drawn up to promote the universal and consistent use of concepts and terminology for the description of laterites and laterite profiles. It was decided that ISRIC should become involved in the compilation of this compendium.

The present book is the result of this decision. It reached its final form through the close collaboration of a number of scientists from various parts of the world, who have studied laterites both in the field and in the laboratory. Dr G.J.J. Aleva, retired chief geologist of Billiton International Metals was prepared to take the lead. He selected and compiled the information available on laterites and prepared a draft document for discussion at a workshop, held in 1992.

This book represents the present state of knowledge of the subject. The first two chapters are devoted to a critical discussion of the history of the concept 'laterite'. Chapters 3 and 4 deal with laterite as part of the regolith, its field appearance and geological evolution, and include many critical observations on the use and abuse of concepts and terminology. In Chapter 5, examples of laterite profiles are presented from a few important areas, viz. India, Australia, Suriname and Brazil. The remaining chapters give practical guidelines for the description and sampling of laterites. There is an elaborate Glossary and a list of more than 200 references. The annex includes various tables which may be of great benefit for those who wish to describe and sample laterites in the field. Thirty two colour pictures illustrate laterite profiles and lateritic materials.
Price: NLG 25, plus handling and postage.
Orders to: ISRIC, PO Box 353, 6600 AJ Wageningen, the Netherlands.

Global Change and Terrestrial Ecosystems (GCTE). Report No 1. GCTE Core Project Office, Canberra, 1994, 135 p. Paperback.

GCTE's twin objectives are: 1) to predict the effects of changes in climate, atmospheric composition, and land use on terrestrial ecosystems, including agriculture, forestry, soils and ecological complexity; 2) to determine how these effects lead to feedbacks to the atmosphere and the physical climate system.

This document describes the first set of individual research projects accepted by the GCTE Scientific Steering Committee into the Core Research Programme. Each project entry includes the project's objective, a description of the research, a list of participating research organizations, agencies providing major support, an annual budget, the number of staff, and a contact person.

An important part of the project description is an identification of the GCTE Task(s) to which the project contributes. GCTE is aiming toward a coordinated, tightly focused programme built around its 39 Tasks.
Orders to: GCTE Core Project Office, CSIRO Division of Wildlife & Ecology, PO Box 84, Lyneham ACT 2602, Australia.

IGBP Global Modelling and Data Activities 1994–1998. Global Change Report No. 30. International Geosphere-Biosphere Programme, Stockholm, 1994, 87 p. Paperback.

This report sets out the goals and directions for Global Analysis, Interpretation and Modelling (GAIM) and IGBP-DIS (Data and Information System) over the next five years, expanding on the recent overview of their activities in IGBP Report 28. Whilst the two main parts of the document can each be regarded as equivalent to a combined science and implementation plan for a Core Project, many of the objectives for IGBP global modelling and data-related activities are more "short term" (3-5 yr), co-evolving with other components of the programme and focusing on the problems that are of particular importance at the present phase of IGBP's development.
Orders to: see below.

African Savannas and the Global Atmosphere. Research Agenda. Global Change Report No. 31. C. Justice, B. Scholes and P. Frost, editors. International Geosphere-Biosphere Programme, Stockholm, 1994, 51 p. Paperback.

This is a report of a workshop on African Savannas, Land Use and Global Change: Interactions of Climate, Productivity and Emissions, held in June 1993 in Zimbabwe. This workshop focused on land-atmosphere interactions, with particular emphasis on sources and sinks of trace gases and aerosol particles and gives information on the following research issues: (1) Carbon sequestration; (2) Biogenic emissions; (3) Pyrogenic emissions; (4) Land-use change; and (5) Herbivory. It also lists ongoing and proposed activities, a research agenda and recommendations.
Orders to: IGBP Secretariat, The Royal Swedish Academy of Sciences, Box 50005, S-10405 Stockholm, Sweden.

1993-1995 Rice Almanac. International Rice Research Institute, Los Baños, 1993, ix + 142 p. ISBN 971-22-0042-6. Paperback.

This publication is a compendium of information on the origin and diffusion of rice, its growth and production, the ecosystems under which it is grown, its significance as one of the world's most important human foods, and opportunities for increased yields and production.

Important data from IRRI's databases, as well as sources such as FAO, are woven into a fabric that shows how rice fits into the political, social, and economic structure of rice-growing countries.
Price: HDC: USD 15; LDC: USD 4
Orders to: see below.

IRRI 1992-1993: Rice in Crucial Environments. International Rice Research Institute, Los Baños, 1993, ix + 65 p. ISBN 971-22-0044-2. Paperback.

This report focuses on the inherent challenge to agricultural researchers to help farmers – in particular

those farmers in crucial environments of the economically less-developed countries of the world – to increase and sustain their productivity. The report describes IRRI's past work in such environments while emphasizing the needs of the future.

The publication features a special fold-out section, "Crucial Issues in Rice Research", which graphically illustrates the environmental conditions and the crucial issues for each of the rice ecosystems.
Price: HDC: USD 15.50; LDC: USD 4.
Orders to: IRRI, Division PR, Information Center, PO Box 933, Manila 1099, Philippines

Rice in Latin America: Improvement, Management and Marketing. F. Cuevas-Pérez, editor. Centro Internacional de Agricultura Tropical, Cali, with International Rice Research Institute, Los Baños, 1993, xii + 288 p. ISBN 958-9138-41-7. Paperback.

The book contains 12 papers and 50 poster summaries and session commentaries that were presented at the 8th International Rice Conference for Latin America and the Caribbean in November 1991. The book interweaves four themes that are critical to rice production: Genetic improvement, Water management, Red rice, and Marketing.
Price: USD 9.50
Orders to: CIAT, Apartado 6713, Cali, Colombia. *For LDC in Asia:* IRRI, Division PR, Information Center, PO Box 933, Manila 1099, Philippines

Land Degradation. C.J. Barrow. Cambridge University Press, Cambridge, New York, 1994, xvii + 295 p. ISBN 0-521-46615-6. Paperback.

Land degradation is fast becoming recognized as a key issue for world conservation as we approach the end of the twentieth century. The complex relationship between human development and the environment is explored, with a particular emphasis on the causes of land degradation processes. Having given a broad overview of what land degradation is and why it is occurring, the author goes on to illustrate the problem in the context of different habitat types such as forests, woodland and drylands. The impact of human activities through global pollution and industrial and urban development, as well as conservation efforts are discussed. Written as an introduction to the topic, this book provides a synthesis of our current understanding of the phenomenon of land degradation.
Price: GBP 19.95; USD 29.95
Orders to: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, U.K. *or:* Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211, U.S.A.

Lead in Soil. Recommended Guidelines B.G. Wixson and B.E. Davies, editors. Science Reviews, Northwood, 1993, v + 132 p. ISBN 0-905927-39-7. Hardback.

This report is intended for those concerned with the question of how to evaluate whether there is a potential human health problem arising from local concentrations of lead in soil. It has been divided into sections: the introduction is followed by a glossary of definitions used in the report. Section 3 is a protocol or logic format called a phase action plan. This is used in a step wise progression through six major areas. The following section provides a concise overview of lead in soil. Information is given about the concentrations of lead found generally in normal soils together with an account of soil formation. Section 6 describes the factors that influence the bioavailability of lead in regard to chemical composition, particle size and nutrition factors. The health section of the report discusses the population groups at risk, definitions of acceptable blood lead concentrations, other sources of lead and evaluations of appropriate case studies that serve as examples. The last section presents descriptive information relating to the overall analysis of risk as associated with the suggested soil lead guidance.
Price: GBP 30; USD 60
Orders to: Science and Technology Letters, PO Box 81 Northwood, Middlesex HA6 3DY, England.

Management of Mycorrhizas in Agriculture, Horticulture and Forestry. Developments in Plant and Soil Sciences 56. A.D. Robson, L.K. Abbott and N. Malajczuk, editors. Kluwer Academic Publishers, Dordrecht, Boston, 1994, ix + 238 p. ISBN 0-7923-2700-4. Hardback.

This book gives a review of our knowledge of the management of mycorrhizas in agriculture, horticulture and forestry. It contains 24 reviews written by leading international scientists. The reviews consider the ecology, biology and taxonomy of arbuscular and ectomycorrhizal fungi, the information and functioning of mycorrhizas and opportunities for managing these symbioses. The papers were presented at the International Symposium on this theme, held in Australia in September 1992. The publication is partly reprinted from Plant and Soil, Vol. 159, No.1 (1994).
Price: NLG 160; USD 93; GBP 61
Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A. *Elsewhere:* Kluwer Academic Publ. Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Biogeochemistry of the World's Land. Advances in Science and Technology. V.V. Dobrovolsky. Translated from Russian by B.V. Rassadin, translation edited by H.T. Shacklette. Mir Publishers, Moscow, with CRC Press, Boca Raton, London, 1994, 362 p. ISBN 0-8493-7536-3. Hardback.

Biogeochemistry is concerned with the role and influence of biotic activity on geochemistry, that is, with the impact of living organisms on the migration and distribution of chemical elements in the Earth's crust.

The purpose of this book was to generalize the essential facts and ideas about biogeochemical cycles and the mass distribution of chemical elements in the world's land biosphere. The book is to a certain extent a summary of the author's experience and experimental biogeochemical material collected in the tundra, taiga, steppes and deserts of Eurasia, in the tropics of Africa and on islands in the Indian and Arctic oceans. It contains much information on Russian conditions, which was hitherto difficult to assess.
Price: GBP 74
Orders to: CRC Press, Inc., 22-24 Torrington Place, London WC1E 7HJ, England; *or:* CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431.

Contaminated Land: Assessment and Redevelopment. R.A. Failey and A.J. Scrivens. Technical Communications, Letchworth, iv + 96 p. ISBN 0-946655-86-3. Paperback.

The aim of this report is to provide an understanding of some of the problems and solutions associated with the redevelopment of contaminated land. The text draws together current guidance and practices used around the world along with much of the experience of the authors. Some definitions of common terms are introduced and a summary of the sources of soil contamination is given. The methodologies adopted for different types of site investigations are discussed and a review of environmental quality criteria and the concept of 'acceptable levels of contamination' is presented.

This report concentrates on the methods used to obtain meaningful site information and how to interpret that information. One chapter presents some case studies in the redevelopment of a number of sites in the UK, and briefly outlines some site remediation technologies in use in the western world.
Price: GBP 28.25
Orders to: Technical Communications, 100 High Avenue, Letchworth, Herts SG6 3RR, England.

Environmental Soil Science. K.H. Tan. Marcel Dekker, Basel, New York, 1994, xiv + 304 p. ISBN 0-8247-9198-3. Hardback.

This publication relates the principles of environmental issues to soil science – illustrating the effect of environmental factors on the formation of different kinds of soils and explicating the impact of climate and vegetation in determining the distribution of soils throughout the world. Discussing soil constituents in the solid, liquid and gas phases, the book shows how to manage resources in accordance with natural ecosystems and demonstrates the best methods of pollution prevention. It stresses the influence of the environment on the weathering of primary minerals and the formation of clay minerals, and highlights organic components, gaseous components, biochemical reactions, and their involvement with the pollution of soil and air. Other topics addressed are: 1) description of soil water and macro- and micronutrients; 2) explanation of electrochemical properties of clay and humic acids as well as their role in pollution; 3) crop production techniques and the changes they bring to soils and the environment; 4) alternative methods of crop production, including soilless agriculture and biotechnology; and 5) implications of agricultural and industrial wastes to environmental quality (acid rain, greenhouse effect, ozone destruction...).
Price: USD 65
Orders to: see below.

Agriculture Field Experiments. Design and Analysis. R.G. Petersen. Marcel Dekker, Basel, New York, 1994, x + 409 p. ISBN 0-8247-8912-1. Hardback.

This book provides statistical and biometrical procedures for designing, conducting, analyzing, and interpreting field experiments – addressing the most important research topics in agriculture, including agronomy, breeding, long- term, and pasture trials; farming systems research; and intercropping research.

Organized by area of agricultural investigations rather than by classes of experimental designs, the volume reviews the research plot, field experimentation, and essential experimental designs. It presents a host of numerical examples illustrating appropriate analytical procedures and data interpretation and discusses in detail the combined analysis of data from several experiments. Furthermore, it examines stability experiments and the combined analysis of on-station yield trials.
Price: USD 150.
Orders to: Marcel Dekker Inc., P.O.Box 5005, Monticello, NY 12701-5185, U.S.A. *or:* Marcel Dekker, Postfach 812, CH-4001 Basel, Switzerland.

Environmental Water and Soil Analysis. Encyclopedia of Environmental Sciences 15. P.R. Trivedi and Gurdeep Raj. Akashdeep Publishing House, New Delhi, 1992, vii + 240 p. ISBN 81-7158-261-3. Cloth.

This book is an attempt to deal with sampling and quantitative techniques which are being used for measurement of a wide variety of physical, chemical and biological parameters of water and soil environments. Every effort has been made to include the modern techniques of quantitative analysis which are mainly used these days. Chemical reactions and principles involved have been deliberately not included so as to avoid complexity of matter.
Price: INR 300.
Orders to: Akashdeep Publishing House, 4374/4B, Ansari Road, Darya Gang, New Delhi 110 002, India.

Sols Caillouteux et Production Végétale. R. Gras. Institut National de la Recherche Agronomique, Paris, 1994, 175 p. ISBN 2-7380-0521-7. Relié.

Les sols dépourvus de cailloux, les plus recherchés pour l'agriculture sont, de ce fait, les plus étudiés. Cependant, ceux qui renferment des quantités appréciables de cailloux représentent une proportion importante des sols utilisés pour la production végétale.

Or, les propriétés des sols caillouteux sont relativement mal connues, parce que les études se bornent souvent à la seule fraction fine, oubliant ainsi délibérément la présence des éléments grossiers. En fait, la terre fine n'est qu'un élément du système que le sol constitue avec les cailloux et elle ne saurait le représenter.

Cet ouvrage est divisé en deux grandes parties: La caractérisation des sols caillouteux, et Les incidences des cailloux sur la production végétale. La première partie comprend la description d'un sol caillouteux et les Mesures des caractéristiques des sols caillouteux (taux de cailloux, masses volumiques). La deuxième partie traite les thèmes suivants: Incidences directes des cailloux sur la culture des plantes; Cailloux et structure de la terre fine; Cailloux et température du sol; Cailloux et écoulement de l'eau; et Transferts d'eau réciproques entre la terre fine et les cailloux poreux: leur rôle dans la réserve en eau du sol.
Prix: FF 220
Commandes à: voir ci-dessous.

Simplification du Travail du Sol. Les Colloques 65. G. Monnier, G. Thevenet et B. Lesaffre, éditeurs. Institut National de la Recherche Agronomique, Paris, 1994, 172 p. ISBN 2-7380-0535-7. Broché.

Cet ouvrage comprend les communications présentées lors d'un colloque organisé à Paris en 1991. La simplification du travail du sol, avec la suppression partielle ou complète du labour traditionnel attire de plus en plus l'attention des agriculteurs et des conseillers agronomes. Ce livre analyse les conséquences agronomiques de la simplification du travail du sol et également son impact sur l'environnement: érosion du sol et pollution des eaux souterraines et superficielles. Il souligne la nécessité d'adapter les références et résultats d'Amérique du Nord pour la simplification du travail du sol en régime (semi)aride – principalement destinés à la conservation du sol – au régime plus humide de l'Europe du Nord.
Prix: FF 160
Commandes à: INRA, Service des Publications, Route de St-Cyr, F-78026 Versailles Cedex, France.

Mining and the Environment. International Perspectives on Public Policy. R.G. Eggert, editor. Resources for the Future, Washington, 1994, viii + 172 p. ISBN 0-915707-72-1. Paperback.

For centuries, denuded landscapes, fouled streams, and dirty air were accepted by society as part of the price that had to be paid for mineral production. Even initial environmental legislation devised by industrialized countries in the 1960s and 1970s was largely designed without mining in mind. And developing countries had little in the way of environmental policy.

With the advent of sustainability in the 1990s, times have changed. Today's economic development, many now feel, must not come at the expense of an environmentally degraded future. Current policies toward mining are under rigorous review, and mineral-rich developing countries are designing environmental policies where none existed before. The mining industry is more concerned that it was even five or ten years ago about the possible effects of environmental policy on its activities.

The book offers viewpoints from analysts from Australia, Chile, the United Kingdom, the United States, and the European Community on issues and challenges this new concern has raised for metal mining.
Price: USD 25 (+ USD 3 for postage and handling)
Orders to: Resources for the Future, Customer Services, PO Box 4852, Hampden Station, Baltimore MD 21211-6955, U.S.A.

Technology for Greenhouse Systems. L.A. Manrique,1994.

Traditionally food demands are met by putting more land under cultivation. But in large areas of the world, all the land that can be farmed is already in use. In the future, increasing food demands will be met from high production systems on lands already being farmed. High productivity will likely come from the use of high yielding cultivars and from manipulating the environment to minimize the risk of crop failure. In this regard, greenhouse systems, which use artificially controlled environments for plant growth, offer potential not only for increased food production but for efficient resource management with minimal risk to the environment and public health.

Although the potential for increased food production through greenhouse agriculture is real and evident, the complexity of factors influencing plant growth and yield in controlled environments is such that multidisciplinary efforts are needed to integrate improved technologies into efficient greenhouse systems. The chapters of this book illustrate the complexity of greenhouse systems and the degree to which different disciplines are involved in improving them.
Price: USD 80
Orders to: Manrique International Agrotech, PO Box 61145, Honolulu, HI 96839, U.S.A.

Physical Properties of Agricultural Materials. Special issue of International Agrophysics. Vol. 8, No. 1,2,3,4, 1994, 703 p. ISSN 0236-8722. Paperback.

This volume is devoted to the 5th International Conference on Physical Properties of Agricultural Materials held in Bonn on September 6-8, 1993. The volume consists of 4 numbers which present papers on the following topics: 1) Physical properties of soils and fertilizers (22 papers); 2) Physical properties of grain crops (35 papers); 3) Physical properties of fruits, vegetables and root crops (26 papers); and 4) Miscellaneous: methods and other agricultural materials (29 papers).
Price: USD 120, incl. postage
Orders to: Foundation for Development of Agrophysical Research, Doswiadczalna 4, PO Box 121, 20-236 Lublin, Poland.

A Holistic Approach to Sustainable Soil Use in SADC Countries. M. Catizzone and S.C. Muchena. European Commission, Directorate General XII, Brussels, 1994. Part 1, 25 p. ISBN 92-826-8291-9, EUR 15808; Part 2, 58 p. ISBN 92-826-8294-3, EUR 15809. Report EUR 15808 EN. Paperback.

This volume includes the proceedings of a workshop held in Harare, November 1993. The intention of this meeting was to use the new conceptual approach defined in Rennes (March 1992) in a specific geographic situation and to verify its applicability as an international action related to benchmark soil sites. Throughout the discussions, the following important concepts were kept in mind: long term sustainable use of the soil; identification of the problems as they are perceived by the SADC participants; consideration of these problems in the local/regional situation, the research programmes needed to solve them; identification of the institutional requirements needed to support research; and the identification of areas and actions of potential co-operation between individual SADC countries and between the European Union and the SADC countries. Vol.1 is the Executive Report, Vol.2 contains the proceedings.
Orders to: Office for Official Publications of the European Communities, L-2985 Luxembourg.

Soil Erosion. Research Methods. 2nd Edition. R. Lal, editor. Soil and Water Conservation Society, Ankeny, and St. Lucie Press, Delray Beach, 1994, xi + 340 p. ISBN 1-884015-09-3. Paperback.

This second edition is a result of the enthusiastic reception of the first edition by soil erosion researchers around the world. It is a response to the continued and growing need to promote the use of appropriate methodology to evaluate soil erosion. This edition retains the themes and layout of the first edition. However, most

chapters have been revised and some additional chapters have been added. Much of the necessary updating was needed in Chapter 1 regarding current statistics available on the global magnitude of soil erosion by water and wind and on denudation rates. New chapters have also been added on modeling wind and water erosion. Extensive revisions and updating have been done in chapters dealing with assessment of erosivity and erodibility, erosion-crop productivity, measuring sediment yield from river basins, and on filed plot techniques. The publication is sponsored by Subcommission C of the ISSS.
Price: GBP 35
Orders to: in Europe: Gazelle Book Services Ltd., Falcon House, Queen Square, Lancaster LA1 1RN, England; *Elsewhere:* St. Lucie Press, Inc, 100 E Linton blvd., Suite 403B, Delray Beach, FL 33483, U.S.A.

Agricultural Productivity, Sustainability, and Fertilizer Use. D.H. Parish. International Fertilizer Development Center, Muscle Shoals, 1993, 21 p. ISBN 0-88090-102-0. Paperback.

Despite its possible detrimental effects on the environment, fertilizer remains indispensable to sustainable agricultural production, according to this report. Part one of the report defines terms that are frequently used in current debates over whether or not to use fertilizer (defined for the purposes of this article as commercial industrial fertilizer). It then goes on to review the reasons for fertilizer use, discussing the relative scarcity of the earth's fertile land resources, the interaction of fertilizers with the basic components of soil productivity, problems involved in sustaining soil fertility, the evolution of fertilizer use, and the relationship between fertilizer use and crop production. It is concluded that the elimination or even the reduction of fertilizer use in developing countries would result not only in the starvation and malnutrition of millions, but also in the increased degradation of the environment through deforestation, soil erosion, and desertification. Part two presents 14 information briefs covering the need for fertilizers, equity issues, and technical aspects of fertilization. Some of the briefs show the value of fertilizers, while others illustrate problems associated with their production and use.
Price: USD 4 (USD 7.50 outside the U.S.A.)
Orders to: see below.

Linking Crop Models with a Geographic Information System to Assist Decisionmaking: a Prototype for the Indian Semiarid Tropics. U. Singh, J.E. Brink, P.K. Thornton and C.B. Christianson. International Fertilizer Development Center, Muscle Shoals, 1993, 39 p. ISBN 0-88090-103-9. Paperback.

This document outlines the need for crop model geographic information systems, the possible uses of such systems, and the methods required in their construction. It also describes, as an example, a study investigating nitrogen fertilizer efficiency in Maharashtra State in the Indian semiarid tropics, using a simulation model of the development, growth, and yield of sorghum coupled with a GIS. The spatial data bases of the GIS contain information on soils, weather, and other inputs needed by the sorghum model, and the system allows regional analyses of model output to be performed and maps to be drawn. There are substantial limitations in the example, and the results should be treated with caution, but the main objective of this document is to demonstrate the power and utility of the approach.
Price: USD 20
Orders to: IFDC, Purchasing Dept., PO Box 2040, Muscle Shoals, AL 35662, U.S.A.

Global Atmospheric-Biospheric Chemistry. Environmental Science Research 48. R.G. Prinn, editor. Plenum Press, New York, London, 1994, viii + 261 p. ISBN 0-306-4484-X. Hardcover.

This volume contains the invited papers and a transcript of the final panel discussion in the First Scientific Conference of the International Global Atmospheric Chemistry Project (IGAC), held in Israel in April 1993. The conference was devoted to the subject of "Global Atmospheric-Biospheric Chemistry". It provided the first comprehensive report of progress under IGAC toward improving our understanding of the chemical and biological processes that determine the changing composition of the earth's atmosphere. This work is a component of the comprehensive International Geosphere-Biosphere Program (IGBP) devoted to measuring and understanding global changes in the past and present, and predicting the future evolution of our planet.
Orders to: Plenum Press, 233 Spring Street, New York, NY 10013, U.S.A.

Soil Biota. Management in Sustainable Farming Systems. C.E. Pankhurst, B.M. Doube, V.V.S.R. Gupta and P.R. Grace, editors. CSIRO, Melbourne, 1994, x + 262 p. ISBN 0-643-05599-1. Paperback.

The soil biota is a highly diverse assemblage of organisms that carry out a wide range of processes that are important for the maintenance of soil fertility and soil health. The development of sustainable farming systems will depend greatly on our ability to capture the benefits that may be derived from improved management of soil biota. This will only be achieved through an increase in our understanding of the soil biota, the functional processes it carries out and how soil and crop management practices affects its activity.

This book contains 27 review papers that cover a range of issues and topics concerned with the management of the soil biota. Emphasis is placed on soil microorganisms and soil macrofauna that are of major importance in agricultural farming systems. Management issues include: management of introduced soil organisms, management of existing soil organisms and soil biotic processes, and management strategies to enhance the activities of beneficial soil biota in low imput farming systems. The potential use of soil organisms and/or soil biotic activities as bioindicators of soil quality and crop productivity is also addressed.
Price: AUD 95
Orders to: CSIRO Publications, PO Box 89, East Melbourne, Vic. 3002, Australia.

Biochemistry of Metal Micronutrients in the Rhizosphere. J.A. Manthey, D.E. Crowley and D.G. Luster, editors. Lewis Publishers, London, Boca Raton, 1994, vii + 372 p. ISBN 0-87371-942-5. Hardback.

This book focuses on chemical factors and biological activities that control the uptake and translocation of essential metal micronutrients by plants and microorganisms. Emphasis is placed on current proposals describing the roles of microorganisms in controlling the biological activities of metal micronutrients in the rhizosphere. Coverage includes basic principles of siderophore-mediated Fe acquisition by microorganisms, siderophores as important regulators of Fe availability to plants and rhizosphere microorganisms, and microbial control of metal micronutrient supply to plants.

The book evaluates plant uptake processes of Fe, Mn, and Zn in solution cultures and integrates this information with a rapidly developing understanding of rhizosphere events. Important consideration is given to the roles of metal ion chelation and soil chemistry in these biological activities.
Price: GBP 82
Orders to: see below.

Crops Residue Management. Advances in Soil Science. J.L. Hatfield and B.A. Stewart, editors. Lewis Publishers, London, Boca Raton, 1994, ix + 220 p. ISBN 1-56670-003-5. Hardback.

This volume was organized to show the residue management strategies in different regions of the United States and to summarize where the current limitations are in applying residue management concepts. The areas of the United States are the Northeast, Pacific West, Great Plains, Midwest, and Southeast. The remaining chapters detail the principles involved in residue management, effects on soil erosion, effects on weeds, effects of cover crops on crop residue, and the soil, climate, residue interactions. There is a large body of scientific knowledge; however, the editors have not begun to develop this information into general principles which can be adapted and applied throughout the United States or the world.
Price: GBP 57.50
Orders to: see below.

Conservation Tillage in Temperate Agroecosystems. M.R. Carter, editor. Lewis Publishers, London, Boca Raton, 1994, x + 390 p. ISBN 0-87371-571-3. Hardback.

In this book, leading agronomic researchers outline present conservation tillage practices in temperate regions and how these systems have been developed and adapted to fit specific environments, including cool humid, cool humid to warm humid, warm humid, and sub-humid to semi-arid continental. Current and past research is summarized to show how soil, climatic, and biological constraints have been overcome or circumvented. The book provides a synthesis of existing work in conservation tillage in temperate agroecosystems and points towards future directions.
Price: GBP 79.
Orders to: see below.

Sustainable Agriculture Systems. J.L. Hatfield and D.L. Karlen, editors. Lewis Publishers, London, Boca Raton, 1994, xi + 316 p. ISBN 1-56670-049-3. Hardback.

Sustainable agriculture embodies many concepts in its attempts to integrate all the aspects of farming systems into a holistic system. This book explores the processes that occur within the components of a sustainable system and shows where we can build upon our existing knowledge to develop the concepts of sustainable agriculture into the new conventional agriculture. Well-know researchers examine a variety of aspects, including production goals, environmental considerations, and economics, to build a knowledge base that allows readers to see where changes in agriculture must be made and how challenges can be met. They compare existing systems against definitions of sustainability and pinpoint those areas where improvements can be made in current systems to further the concepts of sustainability.
Price: GBP 70.
Orders to: see below.

Ecotoxicology of Soil Organisms. Special Publication of SETAC. M.H. Donker, H. Eijsackers and F. Heimbach, editors. Lewis Publishers, London, Boca Raton, 1994, xviii + 470 p. ISBN 0-87371-530-6. Hardback.

This book contains the contributions of the Society of Environmental Toxicology and Chemistry (SETAC) conference held at Sheffield in April 1991. They are arranged according to the type of research and the organism group: Immission of contaminants to the soil (3 papers); Research with microorganisms (4 papers); Research with invertebrates (12 papers); Research with plants (5 papers); Research with higher organisms and food chains (3 papers); Ecotoxicological risk assessment procedures (4 papers). Each group of contributions has an introductory chapter.
Price: GBP 78.
Orders to: CRC Press, Inc., 22-24 Torrington Place, London WC1E 7HJ, England; or: CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431.

Integrated Water Resource Management. IHP Humid Tropics Programme Series No.5. M.M. Hufschmidt and K.G. Tejwani. Unesco, Paris, 1993, 37 p. Paperback.

This document presents in popularized form the fundamentals related to integrated water resource management for the humid tropics. With a fixed supply of water and rapidly increasing demands for water and its services in the humid tropics, sustainability is becoming a more and more difficult goal to achieve. Integrated water resource management, which means making better use of the resources to meet current and future demands, is increasingly seen as the answer to this challenge. The document addresses: Sustainable water resource development; Integrated water resource management: a systems view; The natural water resource system: preserving its integrity; The human activity system: influencing the demand side for water; Making management work; The urban context and the upland watershed context.
Price: free of charge
Orders to: see below.

Modelling Water Resources and Water Demand in Semi-arid Areas. G. Bocco, H. de Brouwer and F. Karanga. Unesco International Hydrological Programme, Paris, 1994, 62 p. + demonstration diskette. Paperback.

This publication prepared by the International Institute for Aerospace Survey and Earth Sciences (ITC) presents a demonstration programme prepared in the framework of the Unesco/ITC programme "Geo-information for the environmentally-sound management of natural resources". The report presents a case study on the use of GIS for the
Samburu District, Kenya, using the Integrated Land and Water Information System (ILWIS).

The objective of the study was to assess the availability of, and various demands for, water resources through the use of spatial data bases. A general data base containing different thematic maps (topography, geology, census data, satellite images etc.) and a hydrologic data base are described and demonstrated.
Price: single copies are available free of charge.
Orders to: see below.

Using Archival Resources for Climate History Research. C. Dhérent and G. Petit-Renaud. Unesco International Hydrological Programme, Paris, 1994, 72 p. Paperback.

Knowledge of the climate in a global perspective is critically dependent on the amount and reliability of observational and other data available for the study of historical and current climate variability and changes. Regular instrumentation observations of climate and weather parameters on the global scale are comparatively recent. It is,
therefore, necessary to complement them by various sources of climate data including, for instance, those obtained from tree ring or isotopic analyses. However, climate-related information contained in documentary sources collected from archives has only been used sporadically although it offers the possibility of studying climatic fluctuations over a period covering more than a hundred years of meteorological observations carried out on the surface of the globe.

A joint study carried out since 1990 by several international organizations has led to the implementation of an archive study on the history of climate. This report describes the different phases of this study, the research methods used, and the preliminary results obtained in a delimited area of Europe. The climatological utilisation of the archive data is also described.
Price: single copies are available free of charge.
Orders to: see below.

Transboundary River Basin Management and Sustainable Development. J.-C. van Dam and J. Wessel, editors. Unesco International Hydrological Programme, Paris, 1994, Vol.I: 253 p, Vol.II: 272 p. Paperback.

These 2 volumes contain the official statements and full papers submitted by the invited speakers to the International Symposium on Transboundary River Basin Management and Sustainable Development, held at Delft in May 1992. The aim of the symposium was two-fold: (1) to make recommendations and suggestions regarding measures to be taken and policies to be followed with respect to transboundary river basin development in the light of sustainable development; and (2) to produce a statement as a follow-up to the UN Conference on Environment and Development, Rio de Janeiro, June 1992, containing recommendations on sustainable development, including adequate measures for pertinent and proper management of transboundary river basins.

Present trends show that sustainable development is one of the major goals of governmental policy throughout the world. This is certainly true in the field of management of international rivers and their basins and is particulary relevant for the Netherlands – where the Symposium was held – which situated in the delta of a number of important rivers.
Price: single copies are available free of charge.
Orders to: Dr. A. Szollosi-Nagy, Director, Div. of Water Sciences, Unesco, 1, rue Miollis, F-75732 Paris Cedex 15, France.

Applications of Reflective Remote Sensing for Land Degradation Studies in a Mediterranean Environment. Netherlands Geographical Studies 177. S.M. de Jong. Thesis, Faculty of Geographical Sciences, Utrecht University, 1994, 237 p. + 12 plates. ISBN 90-6266-113-0. Paperback.

The aim of this thesis is to investigate the role of remote sensing in understanding and modelling land degradation processes. The research was carried out in the southern part of Ardèche province in France, where several degradation features occur. The author presents the erosion model SEMMED, which is used to produce erosion hazard maps. This model integrates remotely sensed data with field data. The maps turn out to be much better than simple extrapolations from plot experiments. It was shown that the spatial variability of land cover types hampers the pixel-by-pixel classification of remotely sensed images and that spatial heterogeneity of an image may be characteristic for specific land degradation units or land cover types. A new method, using fractal dimensions, is presented to express quantitatively the spatial heterogeneity of images. The thesis concludes with a chapter on the use of spectroscopical images and a GIS to model soil erosion hazard.
Price: NLG 39.
Orders to: KNAG/Netherlands Geographical Studies, PO Box 80123, 3508 TC Utrecht, the Netherlands.

Gross Inputs and Outputs of Nutrients in Undisturbed Forest, Taï Area, Côte d'Ivoire. Tropenbos Series 5. J.J. Stoorvogel. The Tropenbos Foundation, Wageningen, 1993, 148 p. ISBN 90-5113-017-1. Paperback.

One of the few large remnants of a once continuous forest cover in West Africa is the Taï National Park in Southwestern Côte d'Ivoire. The present study aims to contribute to the conservation of the Taï National Park. To conserve the forest, sustainable land use systems must be developed. One of the major characteristics of a Tropical Rain Forest area which determines whether the forest can be utilized on a sustainable basis or not is its nutrient balance. Two conclusions emerge. First, it is likely that the Taä forest is undergoing a net loss of nutrients. This decreases the possibilities for wood harvesting, even by selective cutting, without causing damage to the capacity of the land to support the present forest ecosystem. Second, given the low nutrient status of the soils, sustainable agriculture in the surrounding deforested areas will be possible only if ferti-

lizers are applied.
Price: NLG 45.
Orders to: The Tropenbos Foundation, PO Box 232, 6700 AE Wageningen, the Netherlands.

Land Observation by Remote Sensing. Theory and Applications. Current Topics in Remote Sensing 3. H.J. Buiten and J.G.P.W. Clevers, editors. Gordon and Breach Science Publishers, Yverdon-les-Bains, Langhorne, 1993, xvi + 642 p. ISBN 2-88124-940-X (Paperback) 2-88124-939-6 (Hardback).

This book is a translation of the Dutch text, published in 1990 by Pudoc, Wageningen. The technique of remote sensing meets current demands for information about the changing world, for observing earth surface features and monitoring the processes concerning them. This textbook comprises contributions from 26 experts, providing an introduction to remote sensing at university level.

In part A, the principles of remote sensing are described, including remote sensing as a source of land information, object characteristics, physical aspects, instrumentation, data acquisition, modelling of object-to-sensor relationships, digital image processing, structural pattern recognition, image-matching techniques and geographical information systems.

Part B focuses on the applications of remote sensing, with special attention to land inventory and monitoring of land dynamics in the fields of agriculture, forestry, land evaluation, agrohydrology, irrigation, nature conservation and environmental pollution control.
Price: Paperback: USD 38, GBP 24, ECU 32; Cloth: USD 150, GBP 98, ECU 125.
Orders to: STBS, Marketing Dept, PO Box 786, Cooper Station, New York, NY 10276, U.S.A.; *or:* STBS Ltd., PO Box 90, Reading, Berks RG1 8JL, U.K.

Stable Isotopes in Ecology and Environmental Sciences. Methods in Ecology. K.Lajtha and R.H. Michener, editors. Blackwell Scientific Publications, Oxford, Boston, 1994, xix + 316 p. ISBN 0-632-03154-9. Paperback.

The past decade has seen an explosion in the development of techniques for the use of natural abundance isotopes in ecological research; indeed isotope analysis is rapidly becoming a standard tool for physiologists, ecologists and all scientists studying element or material cycles in the environment. Natural abundance isotopes can be used to find patterns and mechanisms at the single organism plant and algal level as well as to trace food webs, understand palaeodiets and follow whole ecosystem cycling in both terrestrial and marine ecosystems.

This book reviews and assesses the theory and practice of stable isotope analysis in a variety of ecological disciplines, with suggestions for both general ecologists who might be considering including such analyses in their studies, as well as for the more experienced isotope ecologist who is pioneering new uses. There are chapters on terrestrial, atmospheric, marine and estuarine systems, as well as a chapter on stable isotopes at the molecular level. Background to methodology is explained; each chapter taking a critical look at the approaches to the solution of a problem. The book features innovative and non-standard techniques, highlighting some of the fastest growing uses of stable isotopes.
Price: GBP 19.50
Orders to: Blackwell Scientific Publications Ltd, Osney Mead, Oxford OX2 0EL, U.K. *or:* Blackwell Scientific Publications Inc., 238 Main Street, Cambridge, MA 02142, U.S.A.

Investing in Natural Capital. The ecological economics approach to sustainability. A.M. Jansson, M. Hammer, C. Folke and R. Costanza, editors. Island Press, Washington, 1994, xvi + 504 p. ISBN 1-55963-316-6. Paperback.

The emerging transdisciplinary field of Ecological Economics examines the broad relationships between ecosystems and economic systems in order to understand the entire interdependent system of humans and nature. This book presents a range of contributions presented at a workshop held in August 1992 in Stockholm. They all express the consensus that (1) economic systems are sub-systems of the global ecosystem, (2) fundamental uncertainty is large and irreducible and certain key ecological processes are irreversible, and (3) there are limits to biophysical throughput through the economic system. Thus we need to conserve natural capital, keep our options open to avoid irreversibilities and create new low consumption opportunities, and consider a broad range of values including ethics, equity, and intergenerational concerns. Proactive management for sustainability should result in simple, implementable policy recommendations based on sophisticated understanding of the underlying systems. The book deals with methodology, case studies, and policy issues to thoroughly explore this provocative and important alternative to conventional solution to environmental problems.
Price: USD 35; GBP 27.50
Orders to: Island Press, Connecticut Avenue, N.W. Suite 300, Washington, DC 20009, U.S.A.; *or:* Earthscan Publications, 120 Pentonville Road, London N1 9JN, U.K.

Rock and Soil. Photocopiable activities. Essentials for Science. T. Jennings. Scholastic Publications, Leamington Spa, 1994,32 p. ISBN 0-590-53151-4. Paperback.

The book examines the properties of materials that play a key part in the world around us, the way in which they are used and the life they support. These activities are designed for children at Key Stage 2 and are based on the learning requirements of scientific investigation, and materials and their properties. The aim of the book is threefold: (1) to illustrate the variety of rocks and their uses; (2) to describe the formation of rocks; (3) to show how rocks are weathered and eroded; and (4) to describe the formation, structure and importance of soil.
Price: GBP 4.99
Orders to: Scholastic Publications, Westfield Road, Southam, Leamington Spa, Warwickshire CV23, 0JH, England.

Soil Series of India. NBSS Publication 40. S. Lal, S.B. Deshpande and J. Sehgal. National Bureau of Soil Sur-

vey and Land Use Planning, Nagpur, 1994, xvi + 684 p. ISBN 81-85460-20-5. Paperback.

The objective of the present publication is to correlate information on different soil series that were established by different organisations and recommended by the Heads of Regional Centers of the NBSS&LUP for giving national status by registering in the national register. In the process of quality control, many series having overlapping characteristics, limited range in characteristics, limited extent, lacking location specificity, etc. were dropped. The process of screening enabled the authors to approve 180 soil series. Included in this bulletin are general characterizations of the profiles and their classification in Soil Taxonomy and detailed site and soil information including some chemical and physical data of typifying pedon of all 180 series. The publication gives also the problems and potentials for rationalising the use of the soils for increased agricultural production.

Orders to: Director, NBSS&LUP, Amravati Road, Nagpur-440 010 India.

Soil Response to Acid Deposition at Different Regional Scales. W. de Vries. Thesis, Wageningen Agricultural University. DLO Winand Staring Centre, Wageningen, 1994, 487 p. ISBN 90-327-0255-6. Paperback.

Enhanced acidification of soil, ground water and surface water by elevated deposition of S and N compounds is one of the most important large-scale environmental problems today. This thesis deals with the quantification of (i) natural and man-induced sources of acidification in agricultural soils and forest soils in the Netherlands; (ii) current impacts of atmospheric S and N deposition on the solution chemistry of acid sandy forest soils in the Netherlands; (iii) various buffer mechanisms in acid sandy soils in the Netherlands; (iv) average critical deposition levels for N and acidity (N and S) for forests, heathlands, ground water and surface water in the Netherlands; (v) regional variability in critical loads for N, S and acidity and the degree by which these loads are exceeded on forests in the Netherlands and in Europe; (v) long-term impacts of acidic deposition on some characteristic non-agricultural soil; and (vii) regional variability in long-term impacts of acidic deposition on forest soils in the Netherlands and in Europe.

Orders to: DLO Winand Staring Centre, PO Box 125, 6700 AC Wageningen, the Netherlands.

Irrigation Design in Africa. Towards an interactive method. J. Ubels and L. Horst, editors. Wageningen Agricultural University, Wageningen and Technical Centre for Rural and Agricultural Co-operation, Ede, 1993, 115 p.

This book seeks to modify the method for designing irrigation systems. A design is not a goal in itself. Rather, it is the use that is made of a system that matters; for farmer and engineer, government and donor. Up to now, irrigation design has been the domain of engineers and been regarded as being concerned mainly, if not only, with the 'nuts and bolts' needed to build a technical system. The use made of a system is therefore not easily turned into a design consideration.

The texts in this book are a result of the international workshop on design of sustainable farmer-managed irrigation in sub-Saharan Africa, held in Wageningen in February 1990. It is divided in 6 chapters: Tuning irrigation systems to their social environment; Irrigation design and African farming systems; Irrigation organization and African communities; Institutions, markets and design; Design as an interactive process; and Designing sustainable farmer-managed irrigation in Africa.

Price: NLG 25

Orders to: Wageningen Agricultural University, Dept. of Irrigation and Soil and Water Conservation, Nieuwe Kanaal 11, 6709 PA Wageningen, the Netherlands.

Sustainable Land Use Systems and Agroforestry Research for the Humid Tropics of Asia. ICRAF Southeast-Asia Report 93-1. International Centre for Research in Agroforestry, Bogor, 1993, x + 125 p. Paperback.

This volume is the summary report of an international participatory training course held from April 26 – May 15, 1993 in Indonesia. It brought together teams of researchers and development specialists from seven countries in Southeast Asia. They were from government agencies, universities, NGO's and international organizations. The objectives of the course were (1) to assemble teams from different disciplines, institutions and countries to jointly explore current concepts and methods for developing more sustainable land-use systems in upland ecosystems, with emphasis on agroforestry solutions; (2) to produce and test new training materials that may be suitable for use in future regional and in-country training courses on land use systems and agroforestry research; and (3) to identify specific follow-on activities at the national or regional level, and the types of support/collaboration required to implement these effectively.

Orders to: ICRAF-Southeast Asia, PO Box 161, Bogor 16001, Indonesia.

Setting Research Priorities. Towards effective farmer-oriented research. J. Douwe Meindertsma, editor. Royal Tropical Institute, Amsterdam, 1994, 263 p. ISBN 90-6832-084-X. paperback.

Initially, there were high hopes for farming systems approaches. They appeared a revolutionary way to revitalize technology development and transfer, by giving farmers a voice in agricultural research. Yet, results seemed disappointing. The book asserts that the fundamental problem is not one of farming systems research and development principles, but that implementing this approach is quite complex. It explores how farming systems can be implemented successfully by improving management techniques. It stresses the importance of linkages among many actors involved.

This publication combines material on management processes, actors, and useful techniques with the practical experiences of farmer-oriented farming systems research and development projects in Benin, Central America, Indonesia, Mali, Tanzania and Zambia. An agenda is suggested in the final chapter: strengthening research management does not imply a need for 'control' of the research process, but for a structured approach that incorporates local knowledge and encourages participation of stakeholders.

Price: NLG 48.
Orders to: KIT Press, Mauritskade 63, 1092 AD Amsterdam, the Netherlands.

Environmental Information Management and Analysis: Ecosystem to Global Scales. W.K. Michener, J.W. Brunt and S.G. Stafford, editors. Taylor & Francis, London, Bristol, 1994, xxvi + 555 p. ISBN 0-7484-0123-7. Hardback.

Environmental science is shifting its focus to studies that require a broad scale and long-term approach; issues relating to scale, spatial variability, global change, and the human dimension are receiving greater research attention. This book identifies state-of-the-art technologies for the management and analysis of environmental data so as to facilitate future research efforts. It presents the basic components that underpin the successful design, implementation, and effective operation of environmental information systems. It identifies new strategies and solutions for massive data storage; data access; facilitating data sharing; assessing and enhancing data quality; developing appropriate standards for metadata; representing change in environmental databases; and managing data associated with, and generated by, simulation modelling. It describes and discusses technologies such as distributed analytical environments; database management systems; integrated GIS and simulation modelling; user interfaces; visualization software; and knowledge-based expert systems.

The book highlights the specific research challenges inherent in the expansion of environmental research to encompass global scales. It examines the status of GIS as a technology to support atmospheric, hydrological, and ecological simulation modelling via dynamic, physically-based modelling strategies, and discusses mechanisms for the successful integration of modelling with GIS.
Price: GBP 55.
Orders to: Taylor & Francis, 4 John St., London, WC1N 2ET, U.K. *or:* Taylor & Francis, 19900 Frost Road, Suite 101, Bristol PA 19007, U.S.A.

Future Groundwater Resources at Risk. IAHS Publication 222. J. Soveri and T. Suokko, editors. International Association of Hydrological Sciences, Wallingford, 1994, x + 532 p. ISBN 0-947571-09-4. Paperback.

This book contains papers selected and reviewed for an International Conference held at Helsinki in June 1994. The quantity and quality of groundwater are influenced by a wide range of natural and human processes. The use of groundwater in domestic, industrial and agricultural water supply continues to increase in relation to that of surface water in most countries in the world. In future, the importance of the use of groundwater will increase significantly. At the same time many risks concerning groundwater pollution are increasing drastically. So it is obvious that all kinds of threats, which can damage the quality of groundwater should be seriously noted. Groundwater is also vulnerable because it can be depleted through over-exploitation or recharge source reduction.

The 55 papers included in this volume are grouped under the following topics: Risks for groundwater; Subsurface system inventories; Groundwater monitoring; Physical and chemical processes; Regulatory issues; and Special needs of developing countries.
Price: USD 75
Orders to: see below.

Groundwater Quality Management. IAHS Publication 220. K. Kovar and J. Soveri, editors. International Association of Hydrological Sciences, Wallingford, 1994, x + 485 p. ISBN 0-947571-98-1. Paperback.

Dealing with problems of groundwater quality requires knowledge of physical, chemical and biological processes in addition to site-specific information regarding the aquifer system. It also requires knowledge of advanced simulation methods and techniques of engineering design. Many previously established concepts and engineering practices must be critically re-examined prior to taking any remedial action and regulatory measures. Such caution is necessary because (1) significant uncertainty exists about the various processes; (2) unexpected complexity is often found in actual field environments; and (3) limitations exist when using modern measurement and simulation methods.

This book contains 46 selected papers for the International Conference held in Tallinn in September 1993. The papers have been divided into six topics: Field investigation and monitoring; Physical processes; Chemical processes; Stochastics, variability and uncertainty; Numerical methods; and Management and remediation.
Price: USD 75
Orders to: IAHS Press, Institute of Hydrology, Wallingford, Oxfordshire OX10 8BB, U.K.

Integrated Resource Management & Landscape Modification for Environmental Protection. J.K. Mitchell, editor. American Society of Agricultural Engineers, St. Joseph, 1993, xii + 387 p. ISBN 0-929355-43-1. Paperback.

This book is the proceedings of the International Symposium held in Chicago in December 1993. It deals with land management and landscape changes for the effective use of the US soil and water resources, with the need to manage all aspects of our environment as a system and take a critical look at the environmental protection of these vital, finite resources. Highlights include: Planning and installing systems; Erosion control; Excess water disposal; Agri-chemical management; Soil management; Plant management; Ecological management; Wetland management; and Computer-based decision support systems.
Price: USD 39.
Orders to: ASAE, Dept. 1631, 2950 Niles Road, St. Joseph, MI 49085-9659, U.S.A.

Mineralization of Hydrocarbons and Gas Dynamics in Oil-contaminated Soils: Experiments and Modeling. J.I. Freijer. Thesis, University of Amsterdam, 1994, v + 170 p. ISBN 90-6787-038-2. Paperback.

This study has been performed to support the optimization of biorestoration techniques. Attention is focused on the identification of abiotic processes that influence aerobic biodegradation of hydrocarbons in soils. The main aim is to determine the importance of

O_2 and CO_2 transport as regulating processes for biodegradation. Modeling techniques are combined with measurements to gain quantitative insight in these processes. This thesis consists of three main parts. In the first part, gas transport related to O_2 consumption and CO_2 production due to biodegradation is discussed. The second part focuses on the mineralization rate as a function of environmental factors in the soil, with special attention to the role of O_2 concentration. Finally, in the last part, the results obtained in the first and the second part are applied to improve landfarming, which is an accepted *ex-situ* biorestoration technique.
Orders to: Dr. J.I. Freijer, Laboratory of Physical Geography and Soil Science, University of Amsterdam, Nieuwe Prinsengracht 130, 1018 VZ Amsterdam, the Netherlands.

Tomography of Soil-Water-Root Processes. SSSA Special Publication 36. S.H. Anderson and J.W. Hopmans, editors. Soil Science Society of America, Madison, 1994, xvii + 148 p. ISBN 0-89118-808-8. Paperback.

Tomography is a very powerful tool for soil science research. Although it has not been widely used for soil science investigations, there are many potential applications. Non-invasive measurement techniques, developed in the field of medicine, have been applied during the past 10 years to the study of water and solute transport in soils.

These techniques include x-ray computed tomography (CT) and magnetic resonance imaging (MRI). As a result, CT and MRI have allowed scientists to non-destructively quantify soil and plant root properties in two or three dimensions at a spatial resolution of approximately 1 mm. Further development of these techniques have made available some very specialized equipment that make non-destructive measurements possible at a spatial resolution equal to the soil pore geometry (10-500 micrometer).

The papers presented in this publication are the proceedings of a symposium held in Minneapolis in November 1992.
Price: USD 21 (advance payment and 10% per book for postage is required).
Orders to: see below.

Variability in Rangeland Water Erosion Processes. SSSA Special Publication 38. W.H. Blackburn, F.B. Pierson Jr., G.E. Schuman, and R. Zartman, editors. Soil Science Society of America, Madison, 1994, xvii + 106 p. ISBN 0-89118-812-6. Paperback.

Degradation of rangelands continues to be a national and international research priority especially in developing countries. Soil erosion is dynamic, highly variable, and difficult to measure precisely. Historically, erosion research on rangeland has emphasized processes controlling erosion for on-site management with little emphasis on off-site impacts. This research led to the development of improved vegetation management practices for erosion control with little erosion predictive capabilities.

In addition, existing rangeland erosion predictive technology is heavily influenced by theory developed for croplands. Current societal interest in environmentally sustainable rangeland management practices has gone beyond on-site concerns to include the impact of soil erosion off-site. This combined with society's tendency to acquire their desires through regulation requires improved erosion prediction technology for rangelands. The Water Erosion Prediction Project (WEPP) offers the opportunity to significantly improve erosion predictive technology for rangelands.
Price: USD 24 (advance payment and 10% per book for postage is required).
Orders to: SSSA Headquarters Office, Book Order Dept., 677 South Segoe Road, Madison WI 53711, U.S.A.

Drainage Principles and Applications. ILRI Publication 16, 2nd edition. H.P. Ritzema, editor. International Institute for Land Reclamation and Improvement, Wageningen, 1994, 1125 p. ISBN 90-70754-339. Hardback.

In this second edition, the text of this well-known handbook has been completely revised to bring it up to date with current developments. The authors of the various chapters have adapted and restructured their material to reflect the changing circumstances in which drainage is practised all over the world. Remarks and suggestions from Course participants have been considered, and some of their points have been incorporated into the new material.

The four volumes have been consolidated into one large work of 26 chapters and an extensive bibliography. The emphasis of the whole is on providing clear explanations of the underlying principles. This edition has new chapters on topical drainage issues, drainage structures, and the use of statistical analysis for drainage and drainage design. Current drainage practices are thoroughly reviewed. Recent development (e.g. computer applications in drainage) are briefly touched upon.
Price: NLG 175; USD 100
Orders to: see below.

Rainwater Harvesting in Arid and Semi-Arid Zones. ILRI Publication 55. Th.M. Boers. International Institute for Land Reclamation and Improvement, Wageningen, 1994, xv + 127 p. ISBN 90-70754-363. Hardback.

Rainwater harvesting is a method of inducing, collecting, storing, and conserving local surface runoff for agriculture in arid and semi-arid zones. Micro-catchments are small catchments consisting of a runoff area of a few hundred square metres and a basin area of a few tens of square metres, in which a tree is planted. A crust on the runoff area induces surface flow, which collects in the basin area. Rainfall on the basin and the collected runoff infiltrate in the basin and are stored as soil water. Storage deep in the profile and a loose top soil conserve the harvested rainwater by reducing soil evaporation losses.

This book describes a design procedure for micro-catchments used as rainwater harvesting systems. Analytical surface-runoff models and a numerical soil-water-flow model are used to describe the supply of runoff and rainfall in micro-catchments. The procedure is illustrated by a prediction of the water to supply to windbreaks in Niger and Nigeria.
Price: NLG 48.

Orders to: ILRI, PO Box 45, 6700 AA Wageningen, the Netherlands.

Environmental Sampling for Trace Analysis. B. Markert. VCH Verlagsgesellschaft, Weinheim, 1994, xxx + 524 p. ISBN 3-527-30051-1. Hardback.

Often too little attention is given to the sampling before and after actual instrumental measurement. This leads to errors, despite increasingly sensitive analytical systems. This book pays proper attention to representative sampling. It offers an overview of the most common techniques used today for taking environmental samples. The techniques are clearly presented, yield accurate and reproducible results and can be used to sample air, water, soils and sediments, plants and animals. This handbook provides a starting point for researchers in the rapidly expanding field of environmental analysis.
Price: DEM 248; GBP 99
Orders to: VCH Verlagsgesellschaft, P.O.Box 10 11 61, D-69451 Weinheim, Germany.

Strategy for Sustainable Development. Proposals for a Swedish Programme. Report 4266. Swedish Environmental Protection Agency, Solna, 1994, 281 p. ISBN 91-620-4266-1. Paperback.

Environmental policy must be preventive and long-term. It must safeguard the interests of future generations in decisions affecting the people of today. Many environmental problems can only be solved in international collaboration, but the forms for this collaboration are far from fully developed.

In order to tackle adverse impacts on the environment, it is important to explore not only their technical causes but, in equal measure, the underlying economic, political and social mechanisms. We need different economic signals and a conscious change-over to political and social patterns that are more conducive to environmentally sound technologies and an environment-friendly way of life.

This volume contains a proposed action programme for the 1990s. It first deals with the Objectives and Present State. The second part considers the major environmental threats: use of land and water; air pollution and noise in urban areas; eutrophication; acidification; ground-level ozone; metals; toxic organic pollutants; depletion of the ozone layer and climate change; products, chemicals and waste. The last part submits the actions proposed, both on international level and in the different sectors of society.
Price: SEK 290.
Orders to: Swedish Environmental Protection Agency, Customer Services Dept., S-171 85 Solna, Sweden.

Soil Salinity and Acidity: Spatial Variability and Effects on Rice Production in West Africa's Mangrove Zone. M. Sylla. Thesis, Wageningen Agricultural University, Wageningen, 1994, vii + 175 p. ISBN 90-5485-286-0. Paperback.

In the mangrove environment of West Africa, high spatial and temporal variability of soil constraints (salinity and acidity) to rice production is a problem for the transfer and adoption of new agronomic techniques, for land use planning, and for soil and water management. The main objectives of this thesis were: 1) to give a comprehensive characterization framework for the West African mangrove environments with emphasis on the possibilities of and constraints for rice cultivation; 2) to determine the various causal factors for soil salinization and acidification; 3) to test whether temporal variability of soil chemistry is sufficient to provide a time window of minimum stress during the rice growing period; 4) to relate the response of rice to improved agronomic practices in specific environments and to provide a means to characterize specific rice growing locations, and 5) to test rice varietal responses to saline and acid soils under different agronomic practices and to relate yields and yield components to the nutrient contents in leaves, in order to diagnose physiological disorders.
Orders to: Dept. of Soil Science and Geology, Wageningen Agricultural University, PO Box 37, 6700 AA Wageningen, The Netherlands.

India – Growing Period for Crop Planning. NBSS Publ. 39. J. Sehgal, D.K. Mandal, C. Mandal and S.C. Yadav. National Bureau of Soil Survey & Land Use Planning, Nagpur, 1993, 5p. + 5 maps. ISBN 81-85460-19-1. Paperback.

This study gives the generalised range of moisture availability period in days per year for average deep soils of India. However, depending on the depth of the soil, situated on landscape system and its geological origin, at micro level, the presented value will differ. The publication also contains maps of India with acreage and productivity of four major crops.
Price: free of charge
Orders to: see below.

Soil Temperature Regimes in India. NBSS Publ. 41. J. Sehgal and D.K. Mandal. National Bureau of Soil Survey & Land Use Planning, Nagpur, 1994, 4p. + map. ISBN 81-85460-23-X. Paperback.

This publication contains a small-scale map of India with soil temperature regimes according to the SCS Soil Taxonomy system of soil classification.
Price: free of charge
Orders to: see below.

Land Evaluation for Land Use Planning. NBSS Publ. 42. D.L. Dent and S.B. Deshpande, editors. National Bureau of Soil Survey & Land Use Planning, Nagpur, 1993, 167p. ISBN 81-85460-21-3. Paperback.

This volume contains papers presented at an Indo-UK workshop held in 1990 at Nagpur and Bangalore. They are arranged according to the technical sessions of the workshop: methods of land resources survey, land evaluation and farming systems research, and computer-based information systems. The conclusions of working groups on each theme are also included.
Price: free of charge
Orders to: see below.

Soil Moisture Regimes in India. NBSS Publ. 43. J. Sehgal and D.K. Mandal. National Bureau of Soil Survey & Land Use Planning, Nagpur, 1993, 5p. + map. ISBN 81-85460-22-1. Paperback.

This publication contains a small-scale map of India with soil moisture regimes according to the SCS Soil Taxonomy system of soil classification. It shows the

Ustic soil moisture regime covers 72% of the total area, followed by Aridic (16%) and Udic (12%). For supporting two crops in a year, which is most crucial for increasing agricultural productivity, irrigation is needed in the regions with an ustic regime.
Price: free of charge
Orders to: NBSS & LUP, Documentation Officer, Amravati Road, Nagpur 440 010, India.

Organic Substances in Soil and Water: Natural constituents and their influences on contaminant behaviour. A.J. Beck, K.C. Jones, M.H.B. Hayes and U. Mingelgrin, editors. The Royal Society of Chemistry, Cambridge, 1993, x + 200 p. ISBN 0-85186-635-2. Hardback.

This volume documents the latest research in the subject and reviews the function, properties and structure of organic matter in soils, while highlighting the role of organic substances in influencing (and frequently dominating) the behaviour and fate of chemical contaminants in soil, surface water and groundwater systems.

The book presents 'state-of-the-art' contributions from leading authorities on the nature of solid and dissolved phase organic substances, their interactions with organic and inorganic chemicals, and the implications of these interactions for agriculture and environmental pollution. It considers recent advances, highlights unresolved problems, and makes suggestions for the direction for future research.
Price: GBP 55
Orders to: Royal Society of Chemistry, Turpin Distribution Services, Blackhorse Road, Letchworth, Herts SG6 1HN, U.K.; *or in USA, Canada and Mexico:* CRC Press Inc., 2000 Corporate Boulevard NW, Boca Raton, FL 33431, U.S.A.

Stratégie de Mise en Oeuvre du Développement Pastoral. Numéro Spécial de Parcours Demain, Avril 1994. Centre International de Hautes Etudes Agronomiques Méditerranéennes, 1994, 187 p.

Ce volume reprend les communications présentées au Deuxième Séminaire International du Réseau Parcours, tenu à Ifrane en septembre 1993. Le séminaire s'est efforcé d'apporter des éléments de réponse aux questions suivantes: Comment se mettent en oeuvre les opérations de développement pastoral? Quels en sont les demandeurs, les acteurs, et finalement les bénéficiaires? Quelles sont les différentes étapes des négociations nécessaires à leur mise en oeuvre, les stratégies d'intervention? Existe-t-il des clés de la réussite des opérations de développement pastoral, et comment identifier rapidement leurs points de blocage? Peut-on exporter des méthodes d'approche globale d'une situation vers une autre, d'un lieu géographique vers un autre?
Commandes à: Réseau Parcours, CHEAM/IAM-M, BP 5056, 34033 Montpellier Cedex 01, France.

Matière Organique et Activités Biologiques dans les Sols Tropicaux. Cahiers ORSTOM, Série Pédologie, Vol. 27 n° 1. 1992, 133 p. Paperback.

Selon le mode de gestion du milieu par l'homme, le niveau et la nature des stocks organiques et des activités biologiques des sols peuvent varier fortement. C'est particulièrement net pour un grand nombre de sols de la zone intertropicale où la demande alimentaire accrue entraîne une intensification des défrichements et une forte diminution des durées de jachère. Des pratiques culturales non adaptées aux conditions édaphiques locales et la trop faible intégration de l'élevage dans certaines sociétés rurales provoquent bien souvent, et parfois sur les court et moyen termes, une 'dégradation' des sols consécutive à de fortes baisses des stocks organiques et au bouleversement de leur fonctionnement biologique.

Mieux connaître le fonctionnement biologique des sols tropicaux et ses conséquences sur le milieu dans des contextes agronomiques et écologiques très variés du monde intertropical doit aider résoudre la question de la pertinence des pratiques culturales en terme de durabilité de la production alimentaire et de la conservation, à long terme, du capital-sol.
Commandes à: Editions de l'ORSTOM, 72 route d'Aulnay, F-9313 Bondy Cedex, France.

Information Exchange Networking for Agricultural Development. A review of concepts and practices. J. Nelson and J. Farrington. Technical Centre for Agricultural and Rural Cooperation, Ede-Wageningen, 1994, viii + 86 p. ISBN 92-9081-1137. Hardback.

The book is concerned primarily with information exchange networking, which is defined as "a collaborative process of information exchange, around a central theme, carried out by actively interested parties". This involves all types of audio-visual or written media. Examples of networking models are given using case histories, and overviews are presented. One chapter deals with two of the most important channels of information exchange used by many networks: the publication of network material for wide circulation and the organization of workshops. The support mechanisms for networks, such as libraries and databases, are discussed in another chapter.
For ACP countries: free of charge, requests to: CTA, PO Box 380, 6700 AJ Wageningen, the Netherlands.
Price for rest of the world: about ECU 12
Orders to: Kniphorst Booksellers, PO Box 67, 6700 AB Wageningen, the Netherlands.

How to Lay out, Maintain and Record a Randomised Block Trial. J.R. Morton. Pacific Regional Agricultural
Programme, Leaflet n° 1, 1994, 8 p.

Agricultural trials depend on the cooperation of everyone involved: project leaders and research workers, the station manager and foreman and the field technician. Most field trials are set out as Randomised Block Designs (RDB), because they are simple. If everyone involved understands how RDBs work, they are likely to succeed. The leaflet sets out the principles in simple language.

Basic Handling and Preparation of Data for Analysis. J.R. Morton. Pacific Regional Agricultural Programme, Leaflet n° 2, 1994, 11 p.

This leaflet shows the importance of collecting data carefully and entering it into a computer for conversion into a form of which a basic statistical analysis can be performed.

How to Carry out and Interpret an Analysis of Variance. J.R. Morton. Pacific Regional Agricultural Programme, Leaflet n° 3, 1994, 7 p.

In this leaflet it is shown how Minitab, a well-known standard analytical software, can be used in the analysis of variance.

Orders to: Pacific Regional Agricultural Programme, GPO Box 12621, Suva, Fiji.

Keys to Soil Taxonomy. 6th Edition. United States Department of Agriculture, Washington, iv + 306 p. Paperback.

This publication serves two purposes. It provides the taxonomic keys necessary for the classification of soils according to Soil Taxonomy in a from that can be used easily in the field, and it also acquaints users of Soil Taxonomy with recent changes in the classification system. This volume includes all revisions of the keys that have so far been approved. The major additions or changes made since the fifth edition (1992) are the recommendations from the International Committee on Aridisols (ICOMID).

Price: USD 19

Orders to: USDA Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954, U.S.A.

Indigenous Soil and Water Conservation in Africa. Centre for Development Cooperation Services, Amsterdam and the International Institute for Environment and Development, London, 1994, iii + 27 p.

This publication includes the proceedings of a workshop held in Ethiopia in June 1994. The specific objectives of the workshop were as follows: (1) To assist with the finalization of the case studies on soil and water conservation in Africathrough a sharing of experience and preliminary analysis; (2) To discuss and evaluate the research methodologies used; (3) To stimulate informal networking between the researchers involved; and (4) To discuss the follow-up phase of the programme.

Orders to: Centre for Development Cooperation Services, De Boelelaan 1115, 1081 HV Amsterdam, the Netherlands.

Time, Trends and Mechanisms of Soil Acidification. B. Wesselink. Thesis, Wageningen Agricultural University, 1994, ix + 129 p. ISBN 90-5485-289-5. Paperback.

The effects of acid atmospheric deposition on forest ecosystems have been studied intensively in the past two decades. Measurements of element budgets in forested ecosystems throughout the world have shown that acid deposition may deplete stores of exchangeable base cations in the soil, decrease the soil pH, increase rates of mineral weathering, and release potentially toxic Al into the soil solution. In summary, acid atmospheric deposition can strongly alter the chemical environment for living organisms.

In this thesis, the mechanisms that may control those phenomena are studied, with emphasis on soil chemical processes. Central in this study are long and comprehensive data sets from continuous measurements (monitoring) of element fluxes in forest ecosystems, specifically from the Solling experimental forest in Germany.

Orders to: Dr. L.G. Wesselink, RIVM, PO Box 1, 3720 BA Bilthoven, the Netherlands.

Implementing Integrated Environmental Management. J. Cairns Jr., T.V. Crawford and H. Salwasser, editors. University Center for Environmental and Hazardous Materials Studies, Blacksburg, 1994, xiii + 137 p. Paperback.

This book focuses on implementing integrated environmental management. Environmental management has been fragmented because various organizations are charged with a specific component but do not manage entire landscape or all ecological components of even a small area. This publication tries to rectify this by an integration of all relevant components.

Price: USD 7

Orders to: Barabara Falls, 1020 Derring Hall (Mail Stop 0415), Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, U.S.A.

Selenium in the Environment. W.T. Frankenberger Jr. and S. Benson, editors. Marcel Dekker, Basel, New York, 1994, xiv + 456 p. ISBN 0-8247-8993-8. Hardback.

Detailing the latest innovative laboratory and field studies on selenium in the ecosystem, this reference discusses the biochemical and geological cycling of Se, its worldwide distribution, and the factors controlling its fate and transport within and between major environmental media – presenting a global assessment of selenium's complex environmental behavior.

This book covers the speciation, transformation, transport, and toxicity of Se ... emphasizes selenium's role in plant and animal health ... analyzes two endemic diseases, and their relationship to Se adsorption, volatilization, and speciation in different types of soil ... assesses the ecological risk of Se poisoning.

Price: USD 165

Orders to: see below.

Remediation of Hazardous Waste Contaminated Soils. D.L. Wise and D.J. Trantolo, editors. Marcel Dekker, Basel, New York, 1994, xii + 929 p. ISBN 0-8247-9160-6. Hardback.

This reference offers a thorough treatment of the remediation of soils contaminated by hazardous wastes and the scientific and engineering issues that must be addressed in creating practical solutions for their reclamation. Presenting traditional physical and chemical methods as well as current and emerging biological methods, the book discusses state-of-the-art techniques of site monitoring and assessment ... demonstrates a wide range of technical approaches that can be used in remediation ... elucidates hydrocarbon remediation ... illustrates actual, in-field remediation processes highlighting bioremediation ... furnishes innovative process modeling studies ... organizes chapters by issues, case studies, traditional methods, and new technologies to facilitate cross-referencing of topics ... etc.

Price: USD 195

Orders to: Marcel Dekker Inc., P.O.Box 5005, Monticello, NY 12701-5185, U.S.A. *or:* Marcel Dekker, Postfach 812, CH-4001 Basel, Switzerland.

Widening Perspectives on Biodiversity. A.F. Krattiger, J.A. McNeely, W.H. Lesser, K.R. Miller, Y. St.Hill and R. Senanayake, editors. International Union for Conservation of Nature and Natural Resources, Gland, and International Academy of the Environment, Geneva, 1994, xvi + 473 p. ISBN 2-8317-0200-3. Paperback.

The papers presented in this book were prepared for the Global Biodiversity Forum held in October 1993. They are divided in 7 sections: 1) the Introduction reveals the Forum's and the Rio Convention's origins, objectives, and characteristics; 2) Achieving Convention objectives through regional collaboration; 3) Activities to incorporate the objectives of the Convention on Biological Diversity into national endeavours and legislation; 4) Broadening participation in implementing the Convention on Biological Diversity: the contribution by specific groups; 5) Issues in conserving and utilising genetic resources; 6) Biodiversity and environmental impact assessment; and 7) The role of NGOs and other institutional mechanisms in implementing the Convention on Biological Diversity.

The contents of these papers do indeed widen perspectives on biodiversity, as they indicate the far-reaching implications of biodiversity conservation for settled doctrine and theory, for established patterns of public policy formulation, for traditional sectoral approaches to organisation and management, for historically established approaches to relations between North and South, for new notions of, and resolutions for, equity within and between nations, for generations to come.

Price: USD 40 (including postage); 40% discount for developing countries and students.

Orders to: International Academy of the Environment, 4 chemin de Conches, 1231 Geneva, Switzerland.

A Knowledge-based System to Assist in the Design of Soil Survey Schemes. N. Domburg. Thesis, Wageningen Agricultural University, 1994, xiv + 192 p. ISBN 90-5485-312-3. Paperback.

This study aimed at formulating the basic design considerations of a knowledge-based system (KBS) to assist in the design of soil survey schemes. This system should incorporate pedological and statistical knowledge. The domain of the system has provisionally been limited to surveys for which a design-based approach, i.e. the use of classical sampling theory, is appropriate.

Initially, the domain of the system has been structured in three layers: (i) an entity structure clarifying the position of the system in a soil survey project; (ii) a model describing the design process as a number of interrelated steps, and (iii) a conceptual framework defining the main concepts and their relations. Further analysis made it possible to specify the tasks in which the KBS should assist: definition of the survey request, selection of prior information, design of outlinear schemes, evaluation and optimization of outlinear schemes, generation of a report, and evaluation a posteriori.

Price: NLG 45.

Orders to: Staring Centrum, PO Box 125, 6700 AC Wageningen, the Netherlands.

The Natural Resources Management Problem in Arid Areas. Development and Environment 13. N. Shanmugaratnam. NORAGRIC, Aas, 1994, vi + 103 p. Paperback.

This monograph represents the first stage of an ongoing study on the Natural Resources Management (NRM) problem in western Rajasthan, India. Its main aim is to present a more integrated picture of the problem in the arid zone as a whole. It is a preliminary exercise in an analytic synthesis of available information on the land-water resources management problems.

The first chapter provides a general theoretical framework that is applicable to a study of the NRM Problem in arid areas. The second chapter presents details regarding the key biophysical parameters and an overview of demographic and resource use trends. The following two chapters deal with the institutional and policy dimensions of the NRM problem. In chapter 3, the available evidence on land degradation is reviewed and analyzed with reference to the main hypothesis stated in the first chapter. Chapter 4 addresses the question of the commons and raises several policy and institutional issues concerning to be crucial to the livelihood of the poor. The final chapter sums up the main arguments of the study and underlines the need for further research on NRM problems with a view to find viable alternatives to the currently dominant resource use practices.

Orders to: NORAGRIC, The Library, PO Box 5002, N-1432 Aas, Norway.

Scale Analysis in Groundwater Hydrology. VUB Hydrologie 24. W. Zijl. Dienst Uitgaven VUB, 1993, 328 p. Paperback.

This volume presents the development of conceptual and mathematical-physical tools to deal with the large differences in spatial and temporal scales, as they occur frequently in applied groundwater hydrology. The 'language' of mathematical physics, especially the language of vector analysis, is used throughout, but this language is amply explained by presenting the equations in their Cartesian equivalents too.

After an introduction of the subject of scale analysis, the basic equations for groundwater flow on a laboratory scale are presented. the next part deals with the question how to determine the largest possible spatial and temporal scale upon which the description of the groundwater basin, and the flow parameters characterizing it, can be based without making impossible an accurate solution of the groundwater flow equations.

After a part on the spatial averaging of Darcy's law and the conductivity parameters, the last part is concerned with the convection and dispersion of matter dissolved in the groundwater.

Price: BEF 700 (postage not included)

Orders to: Dienst Hydrologie, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussel, Belgium.

Institutionalization of Ecological Knowledge: an International Perspective. Special Issue of Ecology International (21). T.P. Boyle and R.A. Carpenter, editors. International Association for Ecology, Aiken, 1994, 103 p. Paperback.

The goal of this volume is to examine some facets of the use of ecological information in other cultures, through illustrative case studies, descriptions of relevant institutions, structuring of government programs, legal and economic considerations, and other cross-cultural factors.

Specific topics include: (1) a basic analysis of the roles of scientists, scientific institutions, policy makers, and resource managers; (2) the history of political realities shaping three large American environmental research projects; (3) recommendations toward an operational definition of sustainability and how institutions would use this information; (4) how use of ecological knowledge has evolved and is implemented under different legal systems; (5)
how basic information on population ecology is applied to management regulation and regional practices for economically important species; (6) how opportunities for the formation of new ecological institutions occur in the face of social, economic, and political change; (7) what institutional factors need to be addressed to allow for formation of new viable institutions in developing countries; and (8) examples or case studies of the formation of environmental institutions.
Orders to: Ecology International, Institute of Ecology, University of Georgia, Athens, Georgia 30602, USA.

Growing Numbers and Dwindling Resources. R. Krishnan, editor. Tata Energy Research Institute, Arlington. ISBN 81-85419-08-6. Hardback.

This book is a collection of research papers in the inter-related fields of demography, environmental sciences, resource economics and developmental policy. It is based on presentations and discussions at the seminar on Population and Natural Resources organised by TERI in New Delhi.

The book contains seven sections. The first section contains insights into the pressures of population on the environment. The second section looks at global demographic trends and changes, with emphasis on environment impacts. The third section deals with sector-specific issues - the urban, housing, energy and transport sectors. The fourth section 'Managing the Pressures' addresses the issues of natural resource management, the roles of technology and participatory development in resolving environmental conflicts. The fifth section is about quantifying the population-natural resources nexus. The sixth section present varying perspectives of the twin problems of population explosion and natural resource depletion, while the last section contains the panel discussions.
Price: USD 44; INR 440
Orders to: Tata Energy Research Institute (TERI), 1600 Wilson Boulevard, Suite 500, Arlington, VA 22209, U.S.A.

Indigenous Technical Knowledge in Farming Systems of Eastern Africa: a Bibliography. M.K. McCall. Iowa State University, Ames, 1994, 101 p. ISBN 0-945271-34-4. Paperback.

This bibliography includes over 1200 items concerning the indigenous knowledge of people in eastern Africa about farming systems, biomass products, natural resource management, land tenure and organization, and related topics, in material up to 1993. About 200 of the items specifically refer to methods of elicitation of indigenous knowledge and how they can be further applied, whether in local initiatives or/and in outsider interventions.
Price: USD 12 (USD 5 for diskette version, IBM or MAC)
Orders to: CIKARD, Curtiss Hall, Iowa State University, Ames IA 50011, U.S.A.

Born from Within. Practice and Perspectives of Endogenous Rural Development. J.D. van der Ploeg and A. Long, editors. Van Gorcum, Assen, 1994, xiv + 298 p. ISBN 90-232-2893-6. Paperback.

The implementation of the new Common Agricultural Policy (CAP) of the European Union, which is inevitable and vital for the balancing of markets and the reduction of structural overproduction, will necessarily have far-reaching consequences for rural development. The CAP tries, indeed, by means of new accompanying measures, not only to urge farmers in the direction of diversification but also towards non-agricultural activities.

This volume considers rural development practices in Europe that rely on the use and re-valorization of local resources. Important here are local knowledge and skills, the ecosystem in the area, specific products and organizational solutions, and the interface between local actors and distant policy makers, consumers and agronomists. Perspectives on endogenous development arise through the comparative analysis of heterogeneity and associated styles of farming in Europe.
Price: NLG 49.75
Orders to: Van Gorcum & Comp., PO Box 43, 9400 AA Assen, the Netherlands.

Memorial Volume M. Gračanin. I. Miljković, editor. Hrvatsko agronomsko društvo, Zagreb, 1992, 228 p. (in Croatian with English and partly German abstracts). Paperback.

This volume is published to commemorate the 90th anniversary of the birth of Mihovil Gračanin and his passing away in 1981. It contains 12 scientific papers and an introductory chapter about the life of Prof. Gračanin. He played a significant role in the ISSS, especially between 1935 and 1954.
Requests to: Prof. I. Miljkovič, Agronomski fakultet, Svetošimunska 25, Zagreb, Croatia.

The Collection and Analysis of Land Degradation Data. RAPA Publication 1994/3. FAO Regional Office for Asia and the Pacific, Bangkok, 1994, v + 261 p. Paperback.

This publication is the report of the Expert Consultation of the Asian Network on Problem Soils, held in Bangkok in October 1993. The primary objective of this consultation was to enable experts from member Network institutions engaged in problem soil research, development and extension to (1) identify on a country basis, current estimates of the extent, severity and location of seven types of land degradation; (2) identify on a country basis current methodology and techniques employed for the collection and analysis of land degradation data; (3) develop a commonly accepted methodology for the collection and analysis of land degradation for use in the establishment of updatable national

and eventually regional land degradation databases; (4) identify on a country basis, constraints to the establishment of national land degradation databases; (5) update the Network directory of institutions and resource persons by country and field(s) of interest; (6) update the Network reference database for inter-country exchange in matters relating to problem soil research, development and extension; and (7) discuss possible Network activities for the 1993-95 biennium.
Orders to: Regional Soil Management and Fertilizer User Officer, FAO Regional Office for Asia and the Pacific, Maliwan Mansion, Phra Atit Road, Bangkok 10200, Thailand.

Agricultural Ethics: Issues for the 21st Century. ASA Special Publication 57. P.G. Hartel, K. Paxton George and J. Vorst, editors. American Society of Agronomy, Madison, 1994, x + 70 p. ISBN 0-89118-121-0. Paperback.

Ethics, or the lack of them, have been dramatically thrust upon the agricultural community over the past few years. Agricultural ethics looks at the philosophical, social, legal, economic, scientific, and aesthetic aspects of agricultural problems and provides guidance for decisions about these problems when they involve competing values. Agricultural ethics have many forms, but as the authors of this book point out, a holistic view and concept of ethics is essential for the well-being of people and the environment in which they live.

The framework will be set for judgement of acceptable behavior of agriculturalists as stewards of soil, water, and biological resources and as providers of safe and nutritious food and fiber. This is urgently needed as evidenced by the questioning of current practices in agricultural production with respect to the use of pesticides and fertilizers, soil degradation, and the eminent introduction of biotechnology products that use genes from totally unrelated organisms to improve crops and livestock.

The book does not address all of the issues nor does it provide comprehensive depth of inquiry in all aspects of agricultural ethics. However, it is an introduction to agricultural ethics as it identifies the complexity and importance of agricultural ethics.
Price: USD 21 (advanced payment and 10 percent per book for postage required)
Orders to: ASA Headquarters Office, Book Order Dept., 677 South Segoe Road, Madison WI 53711, U.S.A.

Population. The Complex Reality. Sir F. Graham-Smith, editor. The Royal Society, London, 1994, xi + 404 p. ISBN 0-85403-484-6 (UK edition) 1-55591-926-X (US edition). Hardback.

This volume contains the papers presented at the October 1993 'Science Summit' of Scientific Academies on World Population held in New Delhi. The Summit was attended by representatives of national academies of science throughout the world. Sixty academies signed a Statement reflecting their continued concern about the intertwined problems of rapid population growth, resource consumption, environmental degradation and poverty. The Statement sets the target of achieving zero population growth within the lifetime of our children.

In an authoritative and comprehensive survey, the academies of the world call upon governments and international decision-makers to take incisive action and adopt an integrated policy on population and sustainable development on a global scale.
Price: GBP 24
Orders to: The Royal Society, Publications Dept., 6 Carlton House Terrace, London SW1Y 5AG, U.K.

Soil and Water Quality. An agenda for agriculture. Committee on Long-Term Soil and Water Conservation Policy, National Research Council. National Academy of Sciences, Washington, 1993, xx + 516 p. ISBN 0-309-04933-4. Hardback.

How can the United States meet demands for agricultural production while solving the broader range of environmental problems attributed to farming practices? National policymakers who try to answer this question confront difficult trade-offs. This book offers four specific strategies that can serve as the basis for a national policy to protect soil and water quality while maintaining U.S. agricultural productivity and competitiveness. The volume provides information that policymakers, researchers, manufacturers, and producers can use to protect soil and water over the long term. Advocating a systems approach, the committee recommends specific farm practices and new approaches to prevention of soil degradation and water pollution for environmental agencies. The volume details methods of evaluating soil management systems and offers a wealth of information on improved management of nitrogen, phosphorus, manure, pesticides, sediments, salt, and trace elements. Landscape analysis of non-point source pollution is also detailed.
Price: GBP 44.95
Orders to: National Academy Press, 2101 Constitution Avenue, NW, Box 285, Washington, DC 20055, U.S.A. *or:* National Academy Press, 36 Lonsdale Road, Oxford OX2 7EW, U.K.

Science for Understanding Tomorrow's World: Global Change. Education in Global Change Project, ICSU, Paris, 1994. ISBN 0-930-357-31-0. Paperback.

The Education in Global Change Project is the result of a worldwide collaboration between science teachers, in schools, colleges and universities, and researchers. The result is a series of student activities, placed for convenience in units, which can be used to introduce important scientific principles to students in the age range of 16-20. The principles are set in the context of key contemporary environmental issues which will, in turn, help students towards the understanding of issues such as the protection of the ozone layer, the enhancement of the greenhouse effect and the destruction of the rain forests.

The project group wants, at the same time, to show how science is a force for good and that scientists have a vital role in enhancing the quality of our lives. However, to show this we must appreciate what advice scientists can give to decision makers, be able to judge the quality of that advice, and appreciate what effect the advice, if accepted, will have on everyone. It is important that students, once in possession of the relevant facts and parameters, are able to make up their own

minds about these and issues yet unfocused.

There are at present six units: The Changing Atmosphere; Clues from the Past: Glimpses of our Future; The Global Carbon Cycle; Population and Land Use; Oceans; and Remote Sensing: Window on Global Change.

Price: GBP 30; USD 40.

Orders to: Prof. D.J. Waddington, The University of York, Dept. of Chemistry, Heslington, York YO1 5DD, U.K. *or:* Prof. J. Stoltman, Dept. of Geography, Western Michigan University, Kalamazoo, MI 49008, U.S.A.

Soil Survey Manual. Agriculture Handbook 18. Soil Survey Division Staff. United States Department of Agriculture, Washington, 1993, xix + 437 p. Hardbound. Stock no. 011-000-04611-0.

This publication superseding the 1962 edition, provides the major principles and practices needed for making and using soil surveys and for assembling and using data related to them. The chapters are arranged in the approximate chronological order in which the work required for a published soil survey is done. As background for the chapters that follow, the first chapter defines the concepts of soils and the nature of soils as geographic bodies, and the second describes the nature and uses of soil surveys, the kinds of soils surveys, and the map units.

The succeeding chapters describe procedures and conventions of soil surveys from the start of a survey to its publication. Chapter 3 deals with the attributes of bodies of soil that are mapped and the details of their internal properties. Chapter 4 tells how to prepare a mapping legend and the descriptive legend. It describes also the supplies, equipment, and mapping bases required for conducting a soil survey. Chapter 5 describes the ways in which data are recorded, stored, and retrieved.

Chapter 6 discusses interpretations of soils surveys, while Chapter 7 describes the publication of the soil survey map, the accompanying text, and other publications based on the findings of soil surveys.

Price: USD 25.00

Orders to: Superintendent of Documents, U.S. Government Printing Office, PO Box 371954, Pittsburg, PA 15250-7954, U.S.A.

Recherches Polaires. Une Stratégie pour l'An 2000. Académie des Sciences. Technique & Documentation-Lavoisier, Paris, 1994, ix + 364 p. ISBN 2-7430-0003-1.

Ce livre comprend les actes du colloque tenu à paris en Décembre 1992. Suite aux 5 contributions de la séance d'ouverture, ce volume comprend 4 sections: La terre et l'espace (7 contributions); La terre solide (4 contr.); La terre fluide (8 contr.); et La terre vivante (9 contr.). En fin de volume, le président de chacune de ses séances présente une synthèse. Celles-ci sont suivies d'une contribution présentant une stratégie pour l'an 2000.

Prix: FFR 160

Commandes à: Technique & Documentation-Lavoisier, 11 rue Lavoisier, F-75384 Paris Cedex 08, France.

Sols de Tunisie. Bulletin de la Direction des Sols 15, 1994 xiii p + 342 p. (English and Arabic abstracts).

Cet ouvrage présente deux principales séries à caractère d'étude, de recherche et d'aménagement relatives aux ressources en sols de la Tunisie. Il fait le point sur l'aridité édaphique liée aux caractères intrinsèques du sol. L'approche adoptée est celle de l'analyse et de la synthèse sur deux thèmes touchant de près le développement agricole et sa durabilité.

La première partie considère l'étude d'un matériau typique des régions arides en grande analogie avec celui qui est à l'origine de grandes productions agricoles de la plaine du nord européenne, le loess saharien à l'origine de tout le système de production des Jessours du sud tunisien et indicateur des paléo-environnements.

Le deuxième thème qui préoccupe les développeurs et les décideurs de l'aménagement, particulièrement dans les régions arides à l'échelle de la planète, est la salinisation. Les résultats de ces études permettent d'envisager les solutions à entreprendre dans la réhabilitation des zones dégradées ou en cours de dégradation des systèmes écologiques sensibles.

Commandes à: Ministère de l'Agriculture, Direction des Sols, 17 rue Hédi Karray, 2080 Ariana, Tunisie.

I Suoli dell'Emilia-Romagna. N. Filippi and L. Sbarbati. Note Illustrative (383 p. Hardback), Legenda e Carta (46 p. Paperback). Ufficio Pedologico, Regione Emilia-Romagna, 1994. (in Italian).

This map covers an important part of northern Italy south of the River Po. It replaces the map published in 1979. The map at scale 1:250.000 shows the distribution of the soils within seven main geomorphological regions ('gruppo'-group). Groups contain 2 to 7 subgroups, also on the basis of terrain criteria, which in turn comprise units. The map shows up to this category, while the legend lists the soil subunits contained in them. The subunits are roughly comparable to, and correlated with soil units of the FAO-Unesco Soil Map of the World legend and families of Soil Taxonomy. An extensive explanatory text give information on the ecological characteristics of the region and descriptions of the mapping units and soils. The text has 14 profile descriptions with analytical data. The book is very well illustrated with colour photographs of representative profiles.

Price: ITL 45.000

Orders to: Archivio del Servizio Cartografico, Regione Emilia-Romagna, viale Silvani 4/3, 40122 Bologna, Italy.

Water Management in the Next Century – Le Management de l'Eau au Siècle Prochain. International Commission on Irrigation and Drainage, New Delhi, 1993, 10 volumes. Paperback.

These volumes form the transactions of the 15th Congress on Irrigation and Drainage, held in The Hague in August 1993. The congress covered a wide range of topics related to infrastructure, water management and water use.

Together with an increase in the cropping intensity, irrigation and drainage have contributed significantly to the growth of food production. There is increased evidence that the growth in agricultural production

might be hampered by a number of factors such as shortage of water, lack of new lands, outmoded water management systems, inadequate drainage, managerial problems, environmental problems, and rising development cost of land and water.

The main theme of the Congress was therefore "Water Management in the Next Century". In this way it intends to contribute to the possible solutions of those problems and to initiate new developments in irrigation and drainage especially suited for the developing countries where large efforts will be required to guarantee a sufficient agricultural production.

Volumes 1A-1D contain 118 papers on the subject Planning and design of irrigation and drainage systems, while volumes 1E-1F present the 49 papers on Irrigation and drainage systems management – Institutional and financial interrelationships. Volume 1G includes the 12 papers of a special session on Irrigation and drainage in competition for water. The general reports can be found in vol. 1H, and the 11 papers of the special session on History of irrigation, drainage and flood control appear in vol. 1I. The last volume (1J) contains the keynote addresses.

Price: USD 395 (including surface mail)

Orders to: The Secretary, ICID, 48 Nyaya Marg, Chanakyapuri, New Delhi 110 021, India.

Recent Advances in Dryland Agriculture. L.L. Somani, editor. Scientific Publishers, Jodhpur, 1993. Part I: xxiv + 252 p. ISBN 81-7233-057-X. Part II: xvi + 475 p. ISBN 81-7233-058-8. ISBN Set of two: 81-7233-059-6. Hardback.

This publication is the proceedings of a National Symposium held at Hyderabad in September 1988. It reviews the progress in research in India and identifies the research gaps in different aspects of dryland agriculture. Besides the inaugural papers, it includes research papers pertaining to crop-weather relationship, drought management, climatically efficient cropping systems, crop improvement, crop management, fertility management, farm machinery and energy utilization, soil and water conservation, etc., in relation to drylands.

Price: INR 850

Orders to: see below.

Arid Land Irrigation and Ecological Management. S.D. Singh, editor. Scientific Publishers, Jodhpur, 1993. xiii + 441 p. ISBN 81-7233-065-0. Hardback.

Increasing importance is being attached to the development of arid areas to harness additional food an fibre needed by a demanding world. Therefore, work on irrigated agriculture with limited water in desertic regions has gained momentum around the world. Amidst increasing competition among alternative uses of water, agriculture system will have to be most efficient to justify the use of water in irrigation. The book includes 11 papers.

Price: INR 750, USD 30

Orders to: Scientific Publishers, PO Box 91, Jodhpur 342001, India

Rice Roots: Nutrient and Water Use. G.J.D. Kirk, editor. International Rice Research Institute, Los Baños, 1994, v + 86 p. ISBN 971-22-0050-7. Paperback.

The rice plant invests up to 60% of its energy as carbon in its root system. The understanding of the rice roots and their function in the capture of nutrients and water lags well behind the understanding of the rest of the plant. This is particularly so for rice, compared with other cereals, because the rice plant's ability to grow under waterlogged conditions arises from morphological and physiological adaptations in its roots.

As part of the last International Rice Research Conference, a symposium on rice roots and the uptake of nutrients and water was held to review present knowledge and to make recommendations for future research. This publication contains selected papers from that symposium.

Price: HDC: USD 12.00; LDC: USD 3.00.

Orders to: see below.

Soil Physical Properties: Measurement and use in rice-based cropping systems. M. Wopereis, M. Kropff, J. Bouma, A. van Wijk and T. Woodhead, editors. International Rice Research Institute, Los Baños, 1994, vi + 111 p. ISBN 971-22-0048-5. Paperback.

Water is the major factor that determines rice production in rainfed and irrigated ecosystems. All too often the scarcity and the necessity for careful use of this resource is ignored. Efficient management of soil water, whether its source be rainfall or irrigation, is vital to global rice production. There has long been a need to improve procedures for the measurement and management of processes related to soil hydrology and soil structure, and to characterize physical and hydrological features of rice soil that determine spatial and temporal variability in rice yield. This manual addresses these problems.

Price: HDC: USD 7.50; LDC: USD 2.00.

Orders to: Division PR, Information Center, IRRI, PO Box 933, Manila 1099, Philippines.

TAPADO. Slash/mulch: How Farmers use it and what Researchers know about it. Cornell International Institute for Food, Agriculture and Development, Ithaca, 1994, viii + 302 p. Paperback.

Systems of slash/mulch have been used for centuries by farmers in the humid tropics, especially where burning is difficult or impossible. When the forest vegetation is slashed, the crops planted in the resulting mulch receive their nutrients from the decomposing vegetation. The frijol tapado system is an example of a system that is easily managed, requires few outside inputs, is sustainable, causes little or no damage to the environment, and provides a stable source of food to its users.

This volume presents the proceedings of a workshop which principle objectives were: (1) To present the results of farmers, researchers, and development workers with various slash/mulch systems and evaluate this knowledge relative to the potential and limitations of the systems; (2) To identify important research directions and plan collaborative research for the improvement of slash/mulch production systems; and (3) To produce a "state of the art" publication on slash/mulch production systems.

TAPADO. Los Sistemas de Siembra con Cobertura. Cornell International Institute for Food, Agriculture and Development, Ithaca, 1994, viii + 302 p.

Los sistemas de siembra con cobertura muerta han sido usados tradicionalmente por siglos por los agricultores del trópico húmedo, especialmente donde la quema es muy difícil o imposible. La vegetación natural se tumba y los cultivos sembrados obtienen sus nutrientes del material vegetal en descomposición. El sistema de frijol tapado es ejemplo de un sistema que se maneja fácilmente, requiere pocos insumos, es sostenible, no causa daño al ecosistema, y provee una fuente estable de alimentos.

Esto libro presenta la actas de un taller. Los principales objetivos de este taller son: (1) Presentar resultados de agricultores e investigadores sobre varios sistemas de siembra con coberturas y evaluar sus potenciales y limitaciónes; (2) Identificar direcciones importantes y planear investigación participativa para la optimización de los sistemas; y (3) Hacer una publicación del conocimiento actual de los sistemas de producción de siembra con cobertura.

Orders/Orden: CIIFAD Publications, Cornell University, Box 14 Kennedy Hall, Ithaca, NY 14953, U.S.A.

Improved Management of Vertisols for Sustainable Crop-Livestock Production in the Ethiopian Highlands: Synthesis Report 1986–92. T. Mamo, A. Astatke, K.L. Srivastava and A. Dibabe, editors. Technical Committee of the Joint Vertisol Project, Addis Ababa, 1993, vii + 199 p. ISBN 92-9053-269-6. Paperback.

Vertisols constitute over 10% of the Ethiopian land mass where unimproved traditiaonl agricultural production practices are still rampant. This called for the establishment in 1986 of a collaborative project: the Joint Vertisol Project (JVP).

The historical perspective, organisational arrangements, strategy of choice, prioritisation, task-sharing, the achievement and related issues constitute the topics of this synthesis report for the seven-year period (1986-92).

Orders to: ILCA, PO Box 5689, Addis-Ababa, Ethiopia.

Proceedings of the IV International Conference on Desert Development. M. Anaya-Garduño, M.A. Pascual-Moncayo and R. Zárate-Zárate. International Desert Development Commission, Montecillo, 1994, xxv + 576 p. ISBN 968-839-185-9. Paperback.

The theme of this conference held in Mexico City in July 1993 was "Sustainable Development for our Common Future". The objective of this conference was to have a comprehensive approach toward sustainable development through achieving a balance between socio-economic development for a better quality of life, protection of the environment against degradation, and proper management techniques for management and conservation of natural resources.

This proceedings contain the papers presented at the conference and related with the following topics: Diagnosis and evaluation of land degradation; Rehabilitation of saline soils; Reforestation; Forage and animal production in arid zones; Water management: Environmental management; and Socio-economical aspects.

Price: USD 25 (plus postage)

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Evaluación, Cartografía y Politicas Preventivas de la Degradación de la Tierra. Ma de la Luz Marcela Ortiz Solorio, M. Anaya Garduño y J.W. Estrada Berg Wolf. 1994, 161 p. ISBN 968-839-186-7

Para conservar los recursos naturales es necesario conocer cual es su estado actual, la velocidad de deterioro si lo hay y el riesgo del área en cuestión a ser deteriorada para poder plantear las medidas preventivas, correctivas y de rehabilitación más adecuadas, considerando siempre las actividades humanas.

El conocimiento de la degradación de la tierra involucra conocer el origen del fenómeno, conocer las características de cada área en particular, costumbres, uso y manejo de la tierra, tecnología y participación de las poblaciones involucradas entre otros. Para así, dar las recomendaciones mas idóneas a cada condición particular. Por tal razón, en el esto libro se comentan las causas, factores y procesos que evidencian la existencia de la degradación o desertificación, así como, la presentación de metodologías de evaluación y cartografía de la misma y además se mencionan las directrices de un plan de acción. El objetivo es que los usuarios de la tierra conozcan estos aspectos con la finalidad de definir prioridades en los trabajos de conservación y restauración de los recursos naturales, ya que si no se ataca el problema desde su origen, las medidas tomadas serán parcialmente útiles.

Precio: USD 11

Orden: Dr. M. Anaya-Garduño, Colegio de Postgraduados, PO Box 91, Chapingo, México 56230, México.

Atlas zum Nitratstrom in der Bundesrepublik Deutschland. F. Wendland, H. Albert, M. Bach und R. Schmidt (Hrsg.). Springer Verlag, Heidelberg, New York, 1993, xi + 96 S. ISBN 3-540-56706-2. Gebunden.

In immer stärkerem Maße werden in den Industrienationen die natürlichen Resourcen durch menschliche Aktivitäten beeinträchtigt. So steigt die Belastung des Grundwassers mit Nitrat ständig. Unter Beteiligung interdisziplinärer Forschungsgruppen wurde erstmals für die Bundesrepublik Deutschland im neuen Gebietsstand der Nitratstrom analysiert. Auf 31 farbigen Rasterkarten sind geowissenschaftliche Grundlagen, Stickstoffbilanzgrößen und Modellergebnisse dargestellt. Zusammen mit instruktiven Graphiken zeigen sie die vielfältigen Wechselwirkungen zwischen Hydrologie, Pedologie, Hydrogeologie und Landnutzung größerer Landschaftseinheiten. *Preis:* DEM 168; ATS 1.310,40; CHF 168

Bestellungen an: Springer-Verlag, Tiergartenstrasse 17, D-69121 Heidelberg, Deutschland; *or:* Springer-Verlag, 175 Fifth Avenue, New York, NY 10010, U.S.A.

Boden in Not. G. Fellenberg. TRIAS-Thieme Hippokrates Enke, Stuttgart, 1994, 178 S. ISBN 3-89373-247-0. Gebunden.

In den letzten Jahrzehnten ist das Umweltbewußtsein der Öffentlichkeit stark gewachsen. Doch wäh-

rend Luft und Wasser davon profitierten, weil Gesetze zu ihrer Reinhaltung durchgesetzt wurden, blieb der Boden weiterhin das Stiefkind unter den lebenswichtigen Elementen. Dieses Buch soll dazu beitragen, die Bedeutung der Böden (insbesondere für die Ernährung und die Trinkwasserversorgung einer immer noch weiter wachsenden Weltbevölkerung) zu erkennen, Verständnis für die Belange der Böden zu wecken und unsere Sinne für Bodenbelastungen zu schärfen. Deshalb wird die Geschichte des Bodens erzählt, wie er entsteht, welche Eigenschaften sich aus der Entstehung ergeben und welche Funktionen Böden für uns Menschen erfüllen.
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Natural weathering of MSWI bottom ash. Transformation of glassy constituents and implications for heavy metal leaching. C. Zevenbergen. Ph.D. Thesis Utrecht University. Eburon Uitgeverij, Delft, 1994, 131p. ISBN 9-05166-405-2.

In this Ph.D-thesis the weathering behaviour of MSWI bottom ash with respect to the glassy constituents is described. Municipal solid waste incinerator (MSWI) bottom ash is a predominantly glassy material and contains hazardous components in concentrations which are elevated compared to the parent source. The glassy material include uncombusted manufactured glasses and glassy material formed during incineration. The neoformed glassy constituents generally consist of relatively small particles often aggregated and adhering to larger particles. Closer examination of the individual particles reveals that the neoformed glassy constituents consist of truly glass particles and glass particles with inherited crystalline regions. These glassy constituents are not chemically inert but respond to changes in environmental conditions. Although the weathering behaviour is analogue to that of volcanic glasses and scoriae, the results presented here establish that bottom ash alters at a considerably faster rate. The initial stage of weathering is dominated by an extreme solution alkalinity and by instantaneous dissolution of those elements that are associated with soluble salts. The rate and sequences of consecutive weathering reactions controlling the concentrations of Si, Al, Ca, Mg, SO_4, and possibly Fe, in the ash pore solution are dictated to a large extent by the rate of atmospheric CO_2 entry. Its heterogeneous nature, high surface area and high 'active' Al and associated Si content predispose bottom ash glasses to form clay minerals in a relatively short course of time. The predicted secondary minerals which may form on the longer term, represent mineral assemblages commonly found in alkaline soils and soils of volcanic origin. A widespread neoformation of clay (illite) from glasses has been observed in a bottom ash deposit which has been allowed to weather in the open for 12 years. Two mechanisms of clay formation have been observed in weathered bottom ash: (a) in situ transformation of glass to clay and (b) dissolution of glass followed by precipitation of clay. TEM observations in conjunction with experimental leaching data indicate that the type of clay mineral formed is determined by local hydrodynamic and physicochemical conditions rather than by the glass composition and alteration mechanism. Although the total impact of newly formed clay minerals on heavy metal leaching is yet to be determined, direct observations and experimental results seem to justify greater emphasis on the role of glass weathering in the immobilization of heavy metals during disposal and utilization of bottom ash.
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L.P. van Reeuwijk, Wageningen.

Simulation of the Biophysical Limitations to Maize Production under Rainfed Conditions in Kenya. Materialien zur Ostafrika-Forschung 12. R. Rötter. Geografische Gesellschaft Trier, 1993, x + 302 p. ISBN 3-921599-17-2. Paperback.

The central part of this thesis deals with the crop growth simulation model WOFOST, elaborated by the Centre for World Food Studies, the Netherlands. Data sets required to further develop and evaluate this model for use in the main areas of maize cultivation in Kenya were available from the Fertilizer Use Recommendation Project. Some modifications and expansions in the model were necessary to fit Kenyan conditions. An important element is the validation of the model. The thesis has an interesting chapter on the application of the model approach at district level and the necessity of more detailed soils, terrain and climatic data.
Orders to: Fachgruppe Geographie/Geowissenschaften, Universität Trier, Trier, Germany.

The New Frontier. Farmers' Response to Land Degradation. A West African study. K.S. Amanor. United Nations Research Institute for Social Development, Geneva, 1994, xii + 244 p. ISBN 1-85649-242-7. Paperback.

The rehabilitation of those regions of the Tropics where monocropping has destroyed both local self-sufficiency and biologically rich and stable environments is fundamental to the success of any strategy for sustainable development.

This study critically explores contemporary policy frameworks for the environment and for development. It places land degradation and economic decline within a political economy framework. Since it focuses on agriculturalists, it also examines agricultural development frameworks in the context of paradigms of development and institutional frameworks for technology generation. It is concerned with the interface between science as a system of understanding and changing the world and the production systems and aspirations of the people as an expression of humanity and its relationship to nature. Finally, the study is concerned with commoditization as it affects both the frontiers of science and popular production.
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Eutrophication of Soil, Fresh Water and the Sea. The Environment in Sweden, Status and Trends. Swedish Environmental Protection Agency, 1994, 208 p. ISBN 91-620-4244-0. Paperback.

The term 'eutrophication' is used in this report to refer to the increased input or availability of plant nutrients, especially nitrogen and phosphorus. It is primarily the biological effects of the increased supply of nutrients that lead to noticeable changes and problems. These effects are therefore often included in the concept of eutrophication. The authors distinguish however between eutrophication and its biological effects and can therefore apply the term to media in which direct biological effects are lacking, such as atmosphere and groundwater.

This report is based on 5 background reports and follows the plant nutrients via the atmosphere, natural terrestrial ecosystems, agricultural systems, groundwater, watercourses/lakes and sea/coast.
Price: SEK 180.
Orders to: Swedish Environment Protection Agency, Custom Services Department, S-171 85 Solna, Sweden.

Soil Survey: Perspectives and Strategies for the 21st Century. ITC Publication 21. J.A. Zinck, editor. International Institute for Aerospace Survey and Earth Sciences, Enschede, 1994, v + 132 p. ISBN 90-6164-097-0. Paperback.

This publication contains the keynote speeches together with selected country reports, presented at an international workshop for heads of national soil survey organizations, held in Enschede in November 1992. The purpose of the workshop was directly related to the concern of the institute (ITC) for collecting firsthand information on the needs, demands and priorities of soil survey organizations in order to update its eduction and research programmes. The workshop was set to focus on "Soil Survey: Perspectives and Strategies for the 21st Century". Concrete objectives were geared towards: (1) identifying and discussing issues and perspectives of soil survey in developing countries, and (2) formulating strategies for its development and consolidation. Issues to be discussed belonged to the institutional, technological, educational and financial domain.
Price: NLG 30,- plus mailing charges.
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Introduction to the Use of Geographic Information Systems for Practical Hydrology. ITC Publication 23. A.M.J. Meijerink, H.A.M. de Brouwer, C.M. Mannaerts and C.R. Valenzuela. International Institute for Aerospace Survey and Earth Sciences, Enschede, 1994, xx + 243 p. ISBN 90-6164-100-4. Paperback.

This book is designed to introduce readers to ways in which geographic information systems can assist in the analysis of water resources for water development projects and watershed management. Attention is focused on practical applications, rather than reviewing potentialities. In part I, spatial data of hydrological relevance from topographic and thematic maps, point data and the data from the high resolution earth observation satellites constitute the input of GIS operations and are therefore discussed in separate chapters. Part II contains a few studies where the use of GIS is explained by way of a problem-driven approach, covering various hydrological themes with special reference to tropical countries.
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Orders to: Bookshop, ITC, PO Box 6, 7500 AA Enschede, the Netherlands.

Chemical Composition of Various Plant Species. V.J.G. Houba and J. Uittenbogaard. Wageningen Agricultural University, 1994, 226 p. Paperback.

The data of this report have been collected from 1981-1993. In that period, 140 different plant species were used in the International Plant-analytical Exchange (IPE) programme. The plant species are listed both with their English and Latin names and come from all over the world. Nutritive plants were sampled at marketable conditions. Most of the other samples came from farmers fields and were handled according to farmers practices. In the report, the content values are given for nearly 40 elements.
Orders to: Dr. V. Houba, Dept. of Soil Science and Plant Nutrition, Wageningen Agricultural University, PO Box 8005, 6700 EC Wageningen, the Netherlands.

CORINE Land Cover. Guide Technique. Commission des Communautés Européennes, Bruxelles, 1993, iv + 144 p. ISBN 92-826-2579-6. (also in English).

Ce volume a pour objet de guider les différents intervenants du projet "CORINE land cover" et leurs continuateurs de l'Agence européenne de l'environnement pour la réalisation d'une base de données géographiques de l'occupation du sol, par photo-interprétation assistée par ordinateur de données des satellites d'observation de la Terre. Ce texte fournit une information détaillée sur les procédures des différentes phases de la méthodologie "CORINE land cover". Le souhait des auteurs est qu'il puisse servir de référence pour tous ceux qui sont impliques dans un projet national et constituer une aide pour ceux qui souhaitent mettre en oeuvre cette méthodologie pour de nouvelles applications. Enfin, il peut être considéré comme un cadre général de réflexion par tous ceux qui travaillent sur la cartographie de l'occupation du sol.
Prix: ECU 13,75
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Genesis of the Soil Salinity in Deserts. Y.I. Pankova. Moscow, 1992, 136p. ISBN 5-7010-0257-8. Paperback (in Russian).

One of the major problems related to desertification is the occurrence and development of soil salinity in dry areas. It is dealt with in this book, based mainly on the experiences in one of most significant desert areas of Eurasia, namely Mongolia and the Central Asian republics of the former USSR. After characterizing salinity and desertification, the physico-geographical properties of the arid territories are described. The author defines the different degrees of aridity and salinity and gives geographical and cartographical identifications of the areas.

The salt affected soils of Mongolia are characterized with extended experimental material of their geographical, chemical, physical and agronomic evaluation. Particular attention is paid to the ecological conditions of the Gobi Desert. In chapter 3, the desertifi-

cation and salinization in the Central Asian republics are described. Particular attention is paid to the valleys of the rivers Syr Darya and Amu Darya as well as to the district of the Aral Sea with a description of adverse processes caused by improper methods of irrigation and land use, leading to intensive salt accumulation.

In Chapter 4 general problems of salt accumulation in dry areas are described. The book contains an extended list of references and an English list of contents and short summary. It is an original and valuable contribution to contemporary knowledge on desertification and soil salinization.

Orders to: Y.I. Pankova, V.V. Dokuchaev Soil Institute, 7 Pyzhevsky Lane, 109017 Moscow, Russia.

I. Szabolcs, Budapest.

Proceedings of the First International Conference on Pedo-Archaeology. Special Publication 93-03. J.E. Foss, M.E. Timpson, M.W. Morris, editors. University of Tennessee, Agricultural Experiment Station, Knoxville, 1993, v + 210 p. Paperback.

The volume includes 22 papers for the February 1992 conference organized in Orlando, Florida. Several papers discuss pedological approaches and techniques useful in soil investigations of archaeological sites, followed by pedo-archaeological case studies from Florida, South Carolina, Arkansas, Illinois, Mexico and Belize. Two papers provide an introduction to Florida Archaeology. There is no index.

The introductory position papers include a lengthy historical review by D.L. Johnson on bioturbation (biomechanical processes) in soil formation and his newest framework for soil landscape evolution, now called dynamic denudation. It incorporates biomechanical processes among the key pedogeomorphic elements - biota, gravity, and water - whereas additions, removals, translocations and transformations, etc. become subsidiary elements. In the context of the conference the absence of discussing the effect of pedoturbation processes on archaeological sites and dating, not even citing his interesting 1970's papers on this, is surprising.

Though the international input to the conference was minimal, the Proceedings volume is a valuable addition to the growing literature on pedo-archaeology.

Orders to: Agricultural Experiment Station, University of Tennessee, Knoxville, TN 37901, U.S.A.

D.H. Yaalon, Jerusalem.

Gleby – Klasyfikacja Genetyczna (Soil Map of Poland). 1:1.500.000. S. Bialousz. Polska Akademia Nauk, Warszawa, 1994.

Based upon earlier, more detailed, inventories of the soils of Poland this new map at 1:1,5 M shows the distribution of 17 soil types and soil type associations of the total of 35 types recognized in the new Polish soil classification system of 1989.

In order to made comparisons possible, the FAO-Unesco Soil Map of the World legend equivalents are also given. The text is in Polish and English.

Orders to: S. Bialousz, Warsaw University of Technology, Faculty of Geodesy and Cartography, Plac Politechniki 1, PL-00661 Warsaw, Poland.

NEW JOURNALS
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Earth Views. Published 3 times a year by the United Nations Environment Programme, Nairobi, 1994.

The new UNEP Environment Assessment Programme, which includes GEMS (Global Environment Monitoring System), GRID (Global Resource Information Database), the State of the Environment Unit, and UN System-wide Earthwatch Coordination has been extensively reshaped to focus more specifically on the needs and capabilities of its users. To keep its audience fully informed and up-to-date, the UNEP Environment Assessment Programme is publishing this newsletter, which will highlight the activities of the new programme, and will feature details on upcoming meetings and events, give brief summaries of past meetings, information on new publications and focus on emerging issues. This newsletter will replace the previous Grid News, Hemisphere, and GEMS/Water Quality Newsletter.

Subscription price: free of charge

Requests to: Environment Assessment Programme, UNEP, PO Box 30522, Nairobi, Kenya.

Natural Resource Perspectives. J. Farrington, editor. Overseas Development Institute, London, 1994.

This is a new series of individually authored papers, drawing on ODI's work on policy and organisational issues in natural resources management. Approximately 5 papers will be produced per year, on an occasional basis. The series aims to illuminate key areas of debate in natural resources management, and make evidence and arguments accessible in summary form to those concerned with the design and implementation of policy who would not normally have time to review long documents.

Number 1 is entitled "Redesigning for risk: tracking and buffering environmental variability in Africa's rangelands. Number 2 treats the following subject: "Public sector agricultural extension: is there life after structural adjustment?"

Requests to: Overseas Development Institute, Regent's College, Inner Circle, Regent's Park, London NW1 4NS, England.

Archaeological Prospection. A.M. Pollard and A. Aspinall, editors. Quarterly published by John Wiley and Sons, Chichester, 1994. ISSN 1075-2196. Paperback.

This new interdisciplinary journal is intended to inform professional archaeologists, local authorities and site developers about the practice and interpretation of a wide range of scientific techniques applied to archaeological sites. It promotes collaborative research between archaeologists and practitioners of prospection techniques, with a view to improving the reliability of archaeological interpretations based on these techniques. The journal aims to encourage international discussion of field procedures, data presentation and interpretation of a wide range of prospection techniques, and promote multi-technique comparison, thus enhancing scientific collaboration.

Disseminating information about new or newly applied prospecting techniques, this journal provides reviews of relevant techniques and applications and offers a forum for the discussion of best practice in professional archaeological prospection. The geographical scope of the journal is international, covering all types of archaeological site (eg. urban, rural, marine, etc.) and the full range of underlying geology.

Subscription price: (1995) Institutional: USD 160; Personal USD 120.

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B. Soil Micromorphology/Micromorphologie du Sol/Bodenmikromorphologie
Dr. C.J. Chartres, CSIRO Division of Soils, P.O. Box 639, Canberra City, ACT 2601, Australia

C. Soil and Water Conservation/Conservation des Sols et des Eaux/Boden- und Wasserschutz
Dr. Ch. Valentin, ORSTOM, B.P. 11416, Niamey, Niger

D. Soil Zoology/Zoologie du Sol/Bodenzoologie (with/avec/mit IUBS)
Prof.Dr. D. Parkinson, Dept. Of Biological Sciences, University of Calgary, 2500 University Drive N.W., Calgary, Alberta T2N 1N4, Canada;

E. Forest Soils/Sols forestiers/Waldböden
Dr. P.K. Khanna, CSIRO, Div. of Forest Research, P.O.Box 4008, Queen Victoria Terrace, Canberra, ACT 2600, Australia

F. Land Evaluation/Evaluation du Terrain/Landbewertung
Prof.Dr. K.J. Beek, ITC, P.O.Box 6, 7500 AA Enschede, The Netherlands

G. Soil Remediation/Restitution des sols/Bodensanierung
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AS Acid Sulphate Soils/Sols Sulphatés Acides/Saure Sulfatböden
Dr. S. Sadio, ISRA/ORSTOM, B.P. 1386, Dakar, Senegal

CR Cryosols/Cryosols/Frostböden
Dr. D.A. Gilichinsky, Inst. of Soil Science & Photosynthesis, Pushchino, Moscow District 142292, Russia

DE Soil Resources of Desert Ecosystems/Ressources de sol dans des ecosystèmes de désert/Böden in Wüstenökosystemen
Dr. A. Sourji, Rue de la ville 2, 5660 Couvin, Belgium

DM World Soils and Terrain Digital Data Base/Carte Internationale Numérique des Sols et des Terrains/ Digitalisierte Internationale Boden- und Landkarte (SOTER)
Prof.Dr. M.F. Baumgardner, Dept. of Agronomy, Purdue University, West Lafayette IN 47907, USA

FA Soil Organic Fertilizers and Amendments/Produits organiques d'engrais et d'amendement du sol/ Organische Dünger und Bodenverbesserungsmittel
Prof.Dr. P. Sequi, Istituto Sperimentale per la Nutrizione delle Piante, Via della Navicella 2-4, 00184 Roma, Italy

LI Land Evaluation Information Systems/Informatique de l'Evaluation des Terres/Informationssysteme zur Landbewertung
Dr. J. Dumanski, Land Resources Research Institute, Agric. Canada, Ottawa, Ontario, Canada K1A 0C6

MO Interactions of Soil Minerals with Organic Components and Microorganisms/Interactions entre les Minéraux du Sol, les Composées Organiques et les Microbes/Wechselwirkungen zwischen Bodenmineralen, organischen Substanzen und Mikro-organismen
Prof. Dr. P.M. Huang, Univ. of Saskatchewan, Dept. of Soil Science, Saskatoon, Sask., Canada S7N 0W0

MV Soil and Moisture Variability in Time and Space/Variabilité du Sol et de l'Humidité dans le Temps et l'Espace/ Boden- und Feuchtigkeitsvariabilität in Raum und Zeit
Prof.Dr. R.J. Wagenet, Dept. of SCAS, Bradfield Hall, Cornell University, Ithaca, NY 14853-1901, USA

PM Pedometrics/Pedométrique/Pedometrik
Prof.Dr.D.E.Myers, Dept.of Mathematics, Univ. of Arizona, Tucson AZ 85721, USA

PP Paleopedology/Paléopédologie/Paläopedologie
Prof.Dr. J.A. Catt, Rothamsted Exp. Station, Soil Science Department, Harpenden, Herts, AL5 2JQ, United Kingdom

PS Paddy Soils Fertility/Fertilité des Sols Rizicoles Irrigués/Fruchtbarkeit von Reisböden
Prof.Dr. Tasnee Attanandana, Dept. of Soil Science, Faculty of Agric., Kasetsart University, Bangkok, 10903, Thailand

PT Pedotechnique/Pédotechnique/Pedotechnik
Dr. J. Koolen, Dept. of Soil Tillage, Wageningen Agric. Univ., Diedenweg 20, 6703 GW Wageningen, The Netherlands

RB World Reference Base for Soil Resources/Base de référence mondiale pour les ressources de sol/ Weltweite Referenzbasis fuer Bodenressourcen
Prof.Dr. J. Deckers, Wildenhoge 13, 3020 Winksele, Belgium

RS Remote Sensing for Soil Survey/Pédologie et Télédétection/Fernerkundung für Bodenkartographie
Dr. M. Mulders, Dept. of Soil Science & Geology, Wageningen Agric. University, P.O. Box 37, 6700 AA Wageningen, The Netherlands

RZ Rhizosphere/Rhizosphère/Rhizosphäre
Prof.Dr. P.J. Gregory, Dept. of Soil Science, Univ. of Reading, Whiteknights, P.O.Box 233, Reading, RG6 2DW, U.K.

SG Soils and Geomedicine/Sols et Géomédecine/Böden und Geomedizin
Prof. Dr. J. Låg, Dept. of Soil Science - AUN, P.O.Box 28, 1432 Ås-NLH, Norway

SP Soil and Groundwater Pollution/Pollution du Sol et des Eaux Souterraines/Boden- und Grundwasserverschmutzung
Prof. Dr. P.J. Wierenga, Univ. of Arizona, Soil & Water Science, Tucson AZ 85721, USA

US Urban and Periurban Soils/Sols urbains et périurbains/Städtische Böden
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Prof. Dr. D.H. Yaalon, Institute of Earth Sciences, Hebrew University, Givat Ram Campus, Jerusalem 91904, Israel

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