



**1990
Supplement**



**Publications
of the
International
Agricultural
Research
and
Development
Centers**



1990
Consultative Group on
International Agricultural Research (CGIAR)
International Rice Research Institute (IRRI)

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International Rice Research Institute (IRRI)

The International Rice Research Institute (IRRI) was established in 1960 by the Ford and Rockefeller Foundations with the help and approval of the Government of the Philippines. Today IRRI is one of the 13 nonprofit international research and training centers supported by the Consultative Group on International Agricultural Research (CGIAR). The CGIAR is sponsored by the Food and Agriculture Organization (FAO) of the United Nations, the International Bank for Reconstruction and Development (World Bank), and the United Nations Development Programme (UNDP). The CGIAR consists of 50 donor countries, international and regional organizations, and private foundations.

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Contents

Part 1	Page
Consultative Group on International Agricultural Research (CGIAR) CGIAR Secretariat 1818 H Street, N.W. Washington, D.C. 20433 USA	1
CGIAR-Supported Centers	
Centro Internacional de Agricultura Tropical (CIAT) Apartado Aéreo 6713 Cali, Colombia	7
Centro Internacional de la Papa (CIP) Apartado Postal 5969 Lima, Peru	27
Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) P.O. Box 6-641 C.P. 06600 Mexico D.F. Mexico	41
International Board for Plant Genetic Resources (IBPGR) Food and Agriculture Organization of the United Nations Via delle Terme di Caracalla 00100 Rome, Italy	53
International Center for Agricultural Research in the Dry Areas (ICARDA) P.O. Box 5466 Aleppo, Syria	59
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) Patancheru, Andhra Pradesh 502 324 India	77
International Food Policy Research Institute (IFPRI) 1776 Massachusetts Avenue, N.W. Washington, D.C. 20036 USA	103

International Institute of Tropical Agriculture (IITA) P.M.B. 5320 Ibadan, Nigeria	119
international Livestock Centre for Africa (ILCA) P.O. Box 5689 Addis Ababa, Ethiopia	127
International Laboratory for Research on Animal Diseases (ILRAD) P.O. Box 30709 Nairobi, Kenya	159
International Rice Research institute (IRRI) P.O. Box 933 1099 Manila, Philippines	171
international Service for National Agricultural Research (ISNAR) P.O. Box 93375 2509 AJ The Hague Netherlands	185
West Africa Rice Development Association (WARDA) 01 BP 2551 Bouake 01 Cote d'Ivoire	213

Part II

Non CGIAR-Supported Centers

Asian Vegetable Research and Development Center (AVRDC) P.O. Box 42 Shanhua, Tainan 741 99 Taiwan, China	219
International Center for Living Aquatic Resources Management (ICLARM) P.O. Box 1501 Makati, Metro Manila Philippines	225
international Council for Research in Agroforestry (ICRAF) P.O. Box 30677 Nairobi, Kenya	241
WINROCK International institute for Agricultural Development (WINROCK) Route 3, Petit Jean Mountain Morrliton, Arkansas 721 10 USA	257

Part III

- Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH 263
Dag Hammarskjöld Weg 1-2, Postfach 51 80
D-6236 Eschborn 1 bei, Frankfurt/Main
F.R. Germany
- International Irrigation Management Institute (IIMI) 299
P.O. Box 2075
Colombo, Sri Lanka
- Australian Centre for International Agricultural Research (ACIAR) 319
G.P.O. Box 1571
Canberra ACT 2601
Australia
- Food and Fertilizer Technology Center for the Asian and Pacific Region (FFTC/ASPAC) 327
5th Fl., 14 Wechow St.
Taipei 10616
Taiwan, China

Foreword

Knowledge gained through international agricultural research is useless unless it is published and disseminated to its target audience of scientists, educators, extension specialists, and farmers.

In 1989 the International Rice Research Institute published *Publications of the International Agricultural Research and Development Centers: 1989*, a 730-page catalog of titles published by 22 International Agricultural Research Centers. The Catalog includes a 182-page keyword index to help the reader locate all publications in certain fields (i.e. cytogenetics, insect resistance, maize).

The 1990 Supplement includes only new titles that are not in the larger 1989 catalog. The two catalogs are the only compilations of the major Center publications and, collectively, are probably the largest catalog of titles on agriculture in developing countries.

The international Rice Research Institute is handling the world distribution of both the catalog and supplement.

Klaus Lampe
Director General
International Rice
Research Institute

CGIAR

Consultative Group on International Agricultural Research

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What is the CGIAR?

What do the international centers do?

The Consultative Group on International Agricultural Research is an association of countries, international and regional organizations, and private foundations that collectively supports 13 international agricultural research institutes. The purpose of the Group is to bring the resources of modern biological and socioeconomic research to bear on the problems of improving agricultural productivity in the tropics and subtropics. The research and training programs undertaken by the centers and sponsored by the Group seek to provide developing countries with superior varieties of essential crops and improved farming systems for the production of food plants and animals. The food crops and livestock on which the centers focus provide 75% of the food consumed in the developing countries. Located mostly in developing countries, the international centers work together with scientists in national institutions to set research priorities, develop technologies suited to the specific needs of the region, evaluate and test the new technologies and to make them available for use by farmers. There are currently 7,000 staff working at the international centers; nearly 900 are senior scientists recruited from over 50 countries. The CGIAR is cosponsored by the World Bank, the United Nations Development Program (UNDP) and the Food and Agriculture Organization (FAO). In 1989, CGIAR members provided \$240 million to the 13 centers.

Contributions of the CGIAR System

Four of the institutes were founded in the 1960s by the Ford and Rockefeller Foundations. The remainder were set up at different times since 1971 when the CGIAR was established. Despite their relatively short existence, the international centers have made remarkable contributions to world food production. As might be expected, the impact of the two oldest institutes, the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) in Mexico, and the International Rice Research Institute (IRRI) in the Philippines, has been the most dramatic. Their mandated crops, rice, wheat and maize, are the most widely consumed food crops in the world. High-yielding, management-responsive varieties of rice and wheat derived from those developed by CIMMYT and IRRI are grown on over 55 million hectares - one third of the area planted to these cereals in the developing world. It is estimated that increased yields feed 500 million people and the economic value of this additional food supply is more than \$10 billion annually.

While less well known, the newer centers are also making an impact on food production and have great potential for future impact. In Latin America national programs have adopted and released more than 100 bean varieties developed in collaboration with scientists at the

Centro Internacional de Agricultura Tropical (CIAT) in Colombia. CIAT is also working on genetic improvements that can double and triple yields of cassava, an important food for some 400 million people in the tropics. In Lima, Peru, the Centro Internacional de la Papa (CIP) is concentrating on increasing production of the world's fourth most important crop. CIP houses the largest collection of potato germplasm in the world. Improved lines of edible legumes and innovative soil and crop management systems for Asia and Africa are being developed by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) based in India.

To further the work of the centers, the CGIAR is seeking a more extensive exchange of knowledge on agricultural research and production among scientists, development workers and educators. A major aspect of this work includes the production of several different types of publications and periodicals.

The CGIAR Secretariat

The CGIAR Secretariat is a small department of the World Bank that provides financial and management services to the membership of the CGIAR. From time to time, the secretariat publishes books and reports about international agricultural research and its impact in developing countries. Most are available from distributors of World Bank publications.

Other Distributors of CGIAR Secretariat Publications:

Agribookstore, c/o Winrock International 1611 North Kent Street,
Arlington, Va. 22209, USA.

Triops Verlag, Hindenburgstrasse 33, 6100 Darmstadt, Federal
Republic of Germany.

All non-priced publications are available in limited quantities free of charge from the CGIAR Secretariat, 1818 H Street, N.W., Washington, DC 20433, USA.

Annual Reports

CGIAR Annual Report 1987-88

October 1988. ISSN 0257-3156.

CGIAR Annual Report 1988-89

October 1989. ISSN 0257-3156.

Monographs

Donald L. Plucknett, Nigel J.H. Smith and Selcuk Ozgediz

Networking in International Agricultural Research

1990 (in press). Cornell University Press. ISBN 0-8014-2384-8.

This book is a critical, evenhanded survey of agricultural research networks which presents examples from the experience of international agricultural research centers and national programs around the world. The authors offer a workable typology and a conceptual framework for studying network effectiveness, and they discuss network development stages from start-up to maturity, including such issues as funding, leadership, and motivation.

Jock R. Anderson, Robert W. Herdt and Grant M. Scobie. The World Bank

Science and Food, The CGIAR and its Partners

1988. ISBN 0-8213-0947-1. US \$14.95.

This study offers a comprehensive assessment of the contributions that the CGIAR centers have made through their research programs and especially through their collaboration with national agricultural research systems in the developing world. The book surveys the products of and achievements of the centers, including new crop varieties, farming techniques, changes in institutions and policies, assistance to national programs, and training.

Food Today and Tomorrow

1990. Secretariat of the Consultative Group on International Agricultural Research.

This policy booklet discusses major issues that touch on agricultural sustainability in developed and developing countries. Topics covered include resources and constraints, policy changes, and the contributions of the international agricultural research system to sustainable development.

An Act of Faith, Research Helps Feed the Hungry

1989. Australian Centre for International Agricultural Research. ISBN 0 949511 94 3.

Published on the occasion of the CGIAR mid-term meeting in Canberra, Australia, this booklet described the work and achievements of

the CGIAR centers and their collaboration with national agricultural research systems.

CD-ROM

Food, Agriculture and Science 1989

CD-ROM disc, computer diskettes and user manual.

The first full-text and image agricultural research CD-ROM. Fully searchable contents, including tables and images of 20 publications, one each from 20 international agricultural research centers.

Free from the CGIAR secretariat to developing country institutions with equipment; for others US \$99 from Knowledge Access International, 2685 Maine Way Suite 1305, Mountain View, Ca. 94043, USA; tel. 415 969-0606, FAX 415 964-2027.

Impact Study Publications

Dana G. Dalrymple, US. Agency for International Development

Development and Spread of High Yielding Maize Varieties in Developing Countries

1988.

CIAT

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General Information

The Centro Internacional de Agricultura Tropical (CIAT) is a development-oriented, agricultural research institution dedicated to the application of science towards lasting alleviation of hunger and poverty in developing countries.

CIAT is one of the 13 international agricultural research centers under the auspices of the Consultative Group on International Agricultural Research (CGIAR).

CIAT's mandate is carried out by four commodity-based research programs which are supported by specialized research units and a training and communications program. The commodity programs are Bean, Cassava, Rice and Tropical Pastures. The first two have a global mandate and the third and fourth have a regional mandate for Latin America and the Caribbean.

Prices

Two price categories have been adopted: Developing and developed countries.

CIAT's policy is to make its publications accessible to researchers, professionals, and interested individuals from developing and developed countries. Thus pricing reflects production costs plus a slight increment to cover handling charges.

Prices are given in US dollars and include a percentage covering airmail costs. Publication prices are updated yearly.

Orders

Mail orders should be addressed to CIAT's Publications Distribution office indicating title, number of copies, and total price, and including payment. Pro forma invoices can be requested from that office to confirm availability and total cost.

Address:

CIAT
Publications Distribution
Apartado aereo 6713
Cali
Colombia

Methods of payment

1. Checks in US dollars or international money orders made out to CIAT, drawn on a US-affiliated bank.
2. CIAT coupons available in US or Colombian currencies in CIAT's library. These coupons may be purchased by mail and paid as indicated above.
3. UNESCO coupons available in local currencies at all UNESCO offices in the capital cities of all countries.
4. Cash purchases at CIAT's Publications Distribution office in US dollars, Colombian pesos, or CIAT coupons.

Distributors

CIAT's publications are also available through the following distribution agents:

Colombia:

Agros, Publicaciones Agrícolas, Cra. 61, No. 5-60, Cali, Colombia.

FAID (Fundación para Actividades de Investigación y Desarrollo), Calle 12 No. 3-42, Of. 401, Apartado 026129, Cali, Colombia.

Federal Republic of Germany:

Triops: Tropical Scientific Books, Toeche-Mittler Distribution, Hindenburgstr. 33, D-6100 Darmstadt, F.R. Germany.

Indonesia:

ESCAP-CGPRT Centre, Jalan Merdeka 99, Bogor 16111, Indonesia.

China:

Harvest Farm Magazine, Ned. N. Liang, Editor-in-chief, 14, Wenchow St., Taipei, Taiwan, China.

United States of America:

Agribookstore (Winrock international), 1611 N. Kent Street, Arlington, VA 22209, USA.

Annual Reports

CIAT Bean Program

Bean Program Annual Report

1989. Pages vary. 20 x 27 cm. Perfect bound, paperback. Limited distribution.

Detailed progress report primarily for information of research collaborators in the bean networks.

CIAT Programa de Frijol

Informe Anual del Programa de Frijol

1989. Variación en número de páginas. 20 x 27 cm. Rústica. Distribución limitada.

Documento de trabajo para información y uso de colaboradores en las redes de investigación en frijol.

CIAT Programa de Pastos Tropicales

Informe Anual del Programa de Pastos Tropicales

1989. Variación en número de páginas. 20 x 27 cm. Rústica. Distribución limitada.

Documento de trabajo para información y uso de colaboradores en la red de investigación de pastos tropicales.

CIAT Tropical Pastures Program

Tropical Pastures Program Annual Report

1989. Pages vary. 20 x 27 cm. Perfect bound, paperback. Limited distribution.

Detailed progress report primarily for information of research collaborators in the tropical pastures network.

Bibliographies, Directories, and Abstracts

CIAT Bean information Center

Abstracts on Field Beans

1990. Pages vary (approx. 326 per volume). 15 x 22 cm. Perfect bound, paperback. ISSN 0120-2928. \$50.00 (Paid annual subscription for developed countries); \$12.50 (Paid annual subscription for developing countries).

Analysis and abstracts of contents of articles in scientific and technical journals, manuals, bulletins, mimeographed works, and other sources, augmenting the citation with keywords for quick retrieval. These abstracts are arranged by subject heading in periodic volumes. All abstracts are subject-and author-indexed. Every title listed is available through the Bean Information Center.

Lareo, L.R. and Gonzalez, F. (Compilers)

Acceptability and Nutritional Quality of Common Beans (*Phaseolus vulgaris* L.). A Bibliography

1989. 268 pages. 15 x 22 cm. Perfect bound, paperback. ISBN 958-91 83-01 -8. \$1 0.00 (Developed countries), \$7.50 (Developing countries).

Brings together scattered information on nutritional aspects of common beans. The titles cited are available in CIAT's library and Bean Information Center.

CIAT Bean Information Center

Bibliography on Bean Research in Africa. Supplement 1988

1988. 214 pages. 15 x 22 cm. Perfect bound, paperback. ISBN 958-9183-03-4. \$1 2.50 (Developed countries), \$1 0.00 (Developing countries).

Includes an annotated bibliography of the scientific literature on beans in Angola, Benin, Burkina Faso, Burundi, Cameroon, Central Africa Republic, Congo, Egypt, Ethiopia, Gabon, Ivory Coast, Kenya, Libya, Madagascar, Malawi, Mauritius, Mozambique, Nigeria, Reunion, Rwanda, Senegal, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zaire, Zambia, and Zimbabwe. An important collection of statistical data was recovered. It contains 656 new entries and

includes author and subject indexes. All documents cited are available in the Bean Information Center, and copies may be requested therefrom. (This supplement updates the 1983 bibliography and the 1984 and 1986 supplements.)

CIAT Centro de Información sobre Frijol

Resúmenes Analíticos sobre Frijol

1990. Variación en número de páginas (aprox. 325/vol.). 15 x 22 cm. Revista. ISSN 01 20-2928. \$50.00 (Suscripción pagada anualmente para países desarrollados); \$12.50 (Suscripción pagada anualmente para países en desarrollo).

Análisis y resúmenes de cientos de artículos publicados en revistas científicas y técnicas, manuales, boletines, trabajos mimeografiados y de otras fuentes, ampliando la cita bibliográfica con palabras claves que permiten una recuperación rápida. Estos resúmenes se organizan por encabezamientos de materia, en volúmenes periódicos. Todos los resúmenes se indexan por autor y por materia, y cada título indicado está disponible por intermedio del Centro de Información sobre Frijol del CIAT.

Janssen, W.G., López S., J. and González, F.

Snap Beans: Present Status In the Developing World and Bibliography of Research (1919-1987)

1988. 411 pages. 15 x 21.5 cm. Perfect bound, paperback. \$10.00 (Developed countries), \$7.50 (Developing countries).

Reviews the present status of snap beans in the developing world and discusses socioeconomic aspects. It contains 922 references to research on snap beans, most of them available at CIAT's library.

CIAT Unidad de Publicación/Publication Unit

Publicaciones del CIAT/CIAT Publications. Catálogo de títulos publicados de 1975 a 1990/Catalog of publications from 1975 to 1990.

1990. 108 páginas/pages. 15 x 22 cm. Cosido al caballete/Saddle stitched. Distribución de cortesía/Complimentary distribution.

Catálogo completo de las publicaciones del CIAT a 1990, con instrucciones para su uso y lista de precios para 1990.

Complete listing of CIAT publications up to 1990, with instructions for use and price list for 1990.

CIAT Unidades de Publicación e Información

Trabajos Publicados por Personal del CIAT en 1988

1989. 54 páginas. 15 x 22 cm. Cosido al caballete. Distribución de cortesía.

Catálogo de trabajos publicados por personal científico y técnico del CIAT en revistas, libros y otras publicaciones de fuera y del CIAT. Con instrucciones para ordenar fotocopias de trabajos existentes en la base de datos y biblioteca del CIAT.

Stanton, J.M. and Rizo, N. (Compilers)

Nematodes of Forage Legumes and Grasses. Catalogue and Bibliography 1961-1985

1988.241 pages. 21 x 29.5 cm. Perfect bound, paperback. ISBN 0-851 98-620-X. \$30.00 (Developing countries); Other countries order from: C.A.B. International, Wallingford, Oxon OX108DE, UK.

Co-publication by C.A.B. International and CIAT, divided into two sections: A catalogue organized by scientific names of tropical forage grasses and legumes, with a list of nematodes associated with each forage species. A bibliography with 840 abstracts of publications on nematodes and a list of 308 references to First Records of associations where nematodes reproduced on plants.

CIAT Centro de Información sobre Pastos Tropicales

Resúmenes Analíticos sobre Pastos Tropicales

1990. Variación en número de páginas (aprox. 400/vol.). 15 x 22 cm. Rústica. ISSN 01 20-2944. \$50.00 (Suscripción pagada anualmente para países desarrollados); \$1 2.50 (Suscripción pagada anualmente para países en desarrollo).

Análisis y resumen del contenido de cientos de artículos publicados en revistas científicas y técnicas, manuales, boletines, trabajos mimeografiados y otras fuentes. La cita bibliográfica incluye palabras claves que permiten una recuperación rápida. Estos resúmenes se organizan por encabezamiento de materia, y se publican en volúmenes periódicos donde se indexan por autor y por materia. Cada título indicado en los resúmenes está disponible por intermedio del Centro de Información sobre Pastos Tropicales.

CIAT Cassava information Center

Abstracts on Cassava

1990. Pages vary (approx. 300 per volume). 15 x 22 cm. Perfect bound, paperback. ISSN 0120-288X. \$50.00 (Paid annual subscription for developed countries), \$12.50 (Paid annual subscription for developing countries).

Analysis and abstract of contents of articles in scientific and technical journals, manuals, bulletins, mimeographed works, and other sources, augmenting the citation with keywords for quick retrieval. These abstracts are arranged by subject heading in periodic volumes. All abstracts are subject-and author-indexed. Every title listed is available through the Cassava information Center at CIAT.

CIAT Cassava information Center

Cassava Research in Africa. A Bibliography. Supplement 1988

1988.474 pages. 15 x 22 cm. Perfect bound, paperback. ISBN 84-89206-81 -3. \$1 7.50 (Developed countries), \$1 3.75 (Developing countries).

1302 new references to African literature on the crop are included, related to the following countries: Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Uganda, Zaire, Zambia, and Zimbabwe. An important collection of statistical data was recovered. Author and subject indexes are provided. All documents are available in the Cassava Information Center.

CIAT Centro de Información sobre Yuca

Resúmenes Analíticos sobre Yuca

1990. Variation en número de paginas (aprox. 300/vol.). 15 x 22 cm. Rústica. ISSN 0120-288X. \$50.00 (Suscripción pagada anualmente para países desarrollados), \$1 2.50 (Suscripción pagada anualmente para países en desarrollo).

Análisis y resumen del contenido de cientos de artículos publicados en revistas científicas y técnicas, manuales, boletines, trabajos mimeografiados y de otras fuentes, ampliando la cita bibliográfica con palabras claves que permiten una recuperación rápida. Estos resúmenes se organizan por encabezamiento de materia en volúmenes periódicos. Todos los resúmenes se indizan por autor y por materia, y cada título está disponible por intermedio del Centro de Información sobre Yuca del CIAT.

Conference, Workshop, and Symposia Proceedings

Hershey; C.H. (Editor Técnico)

Mejoramiento Genético de la Yuca en America Latina

1990. No disponible aún.

Además de informes sobre el cultivo de yuca en los ocho países participantes de America Latina, y de las conclusiones, esta publicación contiene 15 temas de especial interés para el planeamiento y ejecución de programas de mejoramiento, tales como selección, manejo, y uso de materiales, bases genéticas y aspectos prácticos de la investigación. Reunion sobre intercambio de germoplasma, cuarentena y mejoramiento de yuca, que se llevó a cabo en CIAT, en junio de 1987, copatrocinada por CIP y CIAT.

CIAT Programa de Frijol

Progreso en la Investigación y Producción del Frijol Común (*Phaseolus vulgaris* L.)

1989. 462 páginas. 15 x 22 cm. Rústica ISBN 958-9183-02-6. \$22.50 (Países desarrollados), \$17.50 (Países en desarrollo).

Los investigadores de la Red Internacional de Rendimiento y Adaptación del frijol común informan periódicamente sobre los problemas de ese cultivo y los progresos logrados en su mejoramiento, en diversas regiones del mundo. En esta ocasión discuten además el potencial de las nuevas técnicas de investigación (isoenzimas, ADN recombinante), así como la racionalización de los recursos de producción y análisis de las condiciones del pequeño productor rural.

Gourley, L.M. y Salinas, J.G. (Editores)

Sorgo para Suelos Ácidos

1990. Disponible segundo semestre 1990.

Memorias del Taller realizado en 1984 por el International Sorghum and Millet Program, INTSORMIL, el International Crops Research Institute for the Semi-Arid Tropics, ICRISAT, y el Centro Internacional de Agricultura Tropical, CIAT, para evaluar la tolerancia del sorgo a los suelos con toxicidad de aluminio en America Latina.

CIAT Unidad de Apoyo en Comunicaciones e Información

Temas Prioritarios y Mecanismos de Cooperación en Investigación Agropecuaria en America Latina y el Caribe

1988. 515 páginas. 17 x 24 cm. Rústica. ISBN 84-89206-72-4. \$27.50 (Países desarrollados), \$22.50 (Países en desarrollo).

Contiene las presentaciones hechas por expertos ante el seminario internacional patrocinado por el Banco Interamericano de Desarrollo que reunió en 1986 a 29 directores de investigación agrícola de America Latina y el Caribe. Los temas de tales presentaciones fueron: la fijación de prioridades en la investigación agropecuaria, financiamiento de la investigación, apoyo político a la investigación agropecuaria, biotecnología, capacitación en administración de la investigación, mecanismos de cooperación horizontal en investigación, y el apoyo de y a los centros internacionales de investigación agrícola. Cada trabajo esta acompañado de un comentario por un participante con autoridad en el tema y de un resumen en ingles.

Howeler, R.H. and Kawano, K. (Editors)

Cassava Breeding and Agronomy Research in Asia

1988. 350 pages. 19 x 26 cm. Perfect bound, paperback. \$30.00 (Developing countries). Other countries order from: CIAT Regional Cassava Program for Asia, Field Crops Research Institute, Dept. of Agriculture, Bangkok, Bangkok, Thailand.

Proceedings of a regional workshop held in Rayong, Thailand, in October 26-28, 1987, for cassava breeders from Asia. They discussed cassava research in their countries. UNDP and Thailand's Department of Agriculture cosponsored the meeting.

Perez-Crespo, C.A. (Editor)

Metodologías Aplicadas a Proyectos Integrados de Yuca. Memorias del Congreso Latinoamericano Celebrado en Villahermosa, Mexico, 26 a 28 de octubre de 1987

1989. 120 páginas. 15 x 22 cm. Rústica. ISBN 958-9183-00-X. \$5.00 (Países desarrollados), \$3.75 (Países en desarrollo).

Estas memorias reflejan los objetivos del congreso: comparar estrategias de desarrollo y definir elementos comunes en la experiencia latinoamericana en yuca. Incluyen informes de siete países participantes, las conclusiones generales del congreso, y un analisis de la situación del cultivo, los factores de éxito y las necesidades a nivel regional.

Miscellaneous Reports and Brochures

CIAT Bean Program

Programme Haricot pour la Region des Grands Lacs d'Afrique Centrale

1988. 16 páginas/pages. 10 x 21.5 cm. Cosido al caballete/Saddle-stitched, paperback. Distribution de cortesía/Complimentary distribution.

Plegable que describe en francés el proyecto cooperativo en frijol del CIAT en esta region del continente africano. Brochure that describes in French the CIAT bean cooperative project in this region of the African continent.

Schultze-Kraft, R.; Williams, R.J.; Coradin, L.; Lazier, J.R.; Kretschmer, A.E., Jr.; and collaborators Franco, M.A. and Hernandez, C.A.

1989 World Catalog of Centrosema Germplasm/ Catalogo Mundial 1989 de Germoplasma de Centrosema

1989. 322 páginas/pages. 27.5 x 21 cm. Rústica/Perfect bound, paperback. ISBN 958-91 83-13-1. No para venta/Not for sale.

Catálogo copublicado por el CIAT y el IBPGR que compila por primera vez la coleccion mundial de Centrosema. Busca evitar duplicidad de esfuerzos de recolección y señalar vacios en los mismos.

This catalog, published jointly by CIAT and the International Board for Plant Genetic Resources (IBPGR), is the first effort made toward cataloging the world's Centrosema collections. It was developed in an effort to cut down duplication of collection by different agricultural research centers and, consequently, to indicate where there may be serious collection gaps.

CIAT Programa de Yuca

Programa de Yuca del CIAT y Proyectos Integrados para el Desarrollo de la Yuca

1988. 6 páginas. 10 x 22 cm. Cosido al caballete. Distribución de cortesía.

Plegable que describe los proyectos integrados para el desarrollo de la yuca y su relación con el Programa de Yuca del CIAT.

EMATERCE-EPACE-CIAT

Superbrotamento ou 'Floco' da Mandioca. Identificação e Controle

1989. 8 páginas. Distribución de cortesía.

Plegable para agricultores descriptivo de la enfermedad, sus síntomas, y procedimientos de control.

Monographs

Morales, F.J.

Bean Common Mosaic: Screening for Disease Resistance

1989. 26 pages. 15 x 22 cm. Saddle stitched. ISBN 958-91 83-09-3. \$7.50 (Developed countries), \$6.25 (Developing countries).

Translation and revised version of El Mosaico Común del Frijol: Metodología de Investigación y Técnicas de Control (1983).

Schwartz, H.F. and Pastor Corrales, M.A. (Editors)

Bean Production Problems in the Tropics

1989. 654 pages. 72 page color supplement. 15 x 22 cm. Smythsewn, soft cover. ISBN 958-9183-04-2. \$37.50 (Developed countries), \$30.00 (Developing countries).

Review in 24 chapters of bean production constraints in

Latin America and Africa. It updates discussion on problems caused by fungi, bacteria, viruses, nematodes, pests, and soil and environmental factors. New chapters on Africa and regional bean production trends have been added.

Schoonhoven, A. van and Voysest, O. (Editors)

Common Beans: Research for Crop Improvement

1990. In print.

Describes in 18 chapters the different facets of research carried out for this crop to date. Copublication with C.A.B International.

Schwartz, H.F. y Pastor Corrales, M.A. (Editores)

Problemas de Producción de Frijol en los Trópicos

1990. No disponible aún.

Compendio actualizado de las principales limitaciones bióticas y abióticas de la producción de frijol en los trópicos americanos y africanos, con recomendaciones prácticas para su estudio y manejo por el productor. Edición corregida y aumentada de Problemas de Producción del Frijol: Enfermedades, Insectos, Limitaciones Edáficas y Climáticas de *Phaseolus vulgaris* (agotado.)

Abawi, G.S. and Pastor Corrales, M.A.

Root Rots of Beans in Latin America and Africa

1990. In print.

This manual, written for extension workers, agronomists, crop protectionists, and students, aims to present, with the help of 93 color photographs, simple techniques for identifying, growing, and inoculating root-rot pathogens that attack beans growing in tropical America and Africa. The pathogens discussed comprise eight genera of fungi and two of nematodes.

Roca, W.M. y Mroginski, L.A. (Editores Técnicos)

Cultivo de Tejidos en la Agricultura. Fundamentos y Aplicaciones

1990. No disponible aún.

En 40 capítulos describe minuciosamente los principales elementos de un programa de cultivo de tejidos vegetales, desde el establecimiento del laboratorio y la elección de los medios de cultivo, hasta las técnicas refinadas de suspensión celular, cultivo e hibridación de protoplastos, identificación de híbridos con isoenzimas, y marcadores bioquímicos y moleculares. Un extenso glosario y varios apéndices completan la obra en la que han participado, desde 1985, cerca de 50 especialistas de tres continentes. Diseñada como texto avanzado y libro de consulta, es una de las primeras obras de sus características publicada en español en América Latina.

Tripp, R. y Woolley, J.

La Etapa de Planificación de la Investigación en Campos de Agricultores: Identificación de Factores para la Experimentación

1989. 90 páginas. 18 x 25.5 cm. Rústica. ISBN 968-6127-32-1. Solicitarlo a: CIMMYT, Lisboa 27, Apdo. Postal 6-641,06600 Mexico, D.F., México.

Publicación CIMMYT-CIAT que trata sobre las experiencias de ambos centros en investigación y capacitación en fincas. De interés para investigadores y extensionistas. Disponible en inglés y español en CIMMYT y CIAT.

Sylvester-Bradley, R. y Kipe-Nolt, J. (Editors)

Legume-Rhizobium Symbiosis: Methods Manual for Agronomic Evaluation, Selection, and Management

1988. 206 pages. 25.5 x 28.5 cm. Binder. \$15.00 (Developed countries), \$12.50 (Developing countries).

The basic characteristics of legume-rhizobium symbiosis are first discussed, together with the objectives and stages of evaluation in a legume selection program. The strategies adopted for the specific selection of pasture legumes and common beans at CIAT are also discussed. Secondly, the methods available for agronomic research on symbiosis under tropical conditions are detailed and illustrated. Finally, the construction of a sterile chamber and the acetylene reduction method for estimating nitrogenase activity are explained.

Rhizobium strains recommended for inoculating plant species studied at CIAT are listed. This manual will be periodically updated. (CIAT-UNDP Special Project.)

Sylvester-Bradley, R. y Kipe-Nolt, J. (Editoras)

Simbiosis Leguminosa-Rizobio: Manual de Metodos de Evaluación, Selección y Manejo Agronómico

1988.206 páginas. 25.5 x 28.5 cm. Folder argollado. \$1 5.00 (Países desarrollados), \$1 2.50 (Países en desarrollo).

Se discuten, en primer lugar, las características básicas de la simbiosis leguminosa-rizobio, los objetivos y etapas de la evaluación en un programa de selección de leguminosas, y las estrategias para seleccionar específicamente leguminosas forrajeras y frijol común en el CIAT. En segundo lugar, se describen detalladamente y con ilustraciones, los métodos disponibles para aplicar con criterio

agronómico la investigación sobre esa simbiosis a las condiciones del trópico. Finalmente, se explica la construcción de una cámara estéril y el método de reducción del acetileno para estimar la actividad de la nitrogenasa y se adjuntan los listados de cepas de rizobios recomendadas para inocular las especies estudiadas en el CIAT. Este manual se actualizara periódicamente. (Proyecto especial CIAT-UNDP.)

Tripp, R. and Woolley, J.

The Planning Stage of On-Farm Research: Identifying Factors for Experimentation

1989. 86 pages. 18 x 26 cm. Perfect bound, paperback. ISBN 968-6127-02-X. Order from: CIMMYT, Lisboa 27, Apdo. Postal 6-641, 06600 Mexico D.F., Mexico.

CIMMYT-CIAT publication containing the experience of both centers on on-farm research training. Of interest to both researchers and extension agents involved in on-farm experimental programs. Available in English and Spanish at CIMMYT and CIAT.

Toledo, J.M.; Vera, R.; Lascano, C. and Lenne, J. (Technical Editors)

Andropogon gayanus Kunth: A Grass for Tropical Acid Soils

1990. 382 pages. 15 x 22 cm. Perfect bound, paperback. ISBN 84-89206-79-1. \$22.50 (Developed countries), \$17.50 (Developing countries).

Comprehensive monograph on this forage grass introduced from Africa to the Latin American tropics (Eastern Plains of Colombia) in 1973. Its 14 chapters were written by scientists from CIAT's Tropical Pastures Program, covering from the botanical description of the grass to the economic analysis of seed production and pasture establishment.

Toledo, J.M.; Vera, R.; Lascano, C. and Lenne, J. (Editores Técnicos)

Andropogon gayanus Kunth: Un Pasto para los Suelos Ácidos del Trópico

1989. 406 páginas. 15 x 22 cm. Rústica. ISBN 84-89206-80-5. \$22.50 (Países desarrollados), \$17.50 (Países en desarrollo).

Monografía completa de esta gramínea forrajera originaria de África e introducida al trópico latinoamericano (Llanos Orientales de Colombia) en 1973. Conforman la obra 14 trabajos de científicos del

Programa de Pastos Tropicales del CIAT, los cuales abarcan desde la descripción botánica hasta el análisis económico de la producción de semilla y establecimiento de la gramínea en pasturas.

Schultze-Kraft, R. and Clements, R.J. (Editors)

Centrosema: Biology, Agronomy, and Utilization

1990. Available second semester 1990.

In tropical regions, the cattle industry is expanding onto marginal lands, creating a demand for tropical legumes that can adapt to, and help improve, low-fertility soils. The genus *Centrosema* contains many species that have agronomic potential for such soils. The first twelve chapters describe the biology of *Centrosema*. The next ten chapters describe agronomic research on the genus in various tropical regions of the world, and the last chapter makes recommendations for future research.

Paladines, O. and Lascano, C. (Technical Editors)

Forage Germplasm under Small-Plot Grazing: Evaluation Methodologies

1990. Not available yet.

This book, originally published in Spanish for RIEPT (Red Internacional de Evaluación de Pastos Tropicales), is the third of a series of five on pasture evaluation. It discusses selection of new germplasm for pastures, methods for developing pastures from that germplasm, the effects climate, soils, grazing systems, and animals have on pastures, implications of small versus large-scale grazing evaluation, and a mathematical interpretation of the pasture-grazing cycle.

Rivas, L.; Sere, C.; Sanint, L.R. y Cordeu, J.L.

La Demanda de Carnes en Países Seleccionados de América Latina y el Caribe

1989. 196 páginas. 15 x 22 cm. Rústica ISBN 84-89206-77-5. \$7.50 (Países desarrollados), \$6.25 (Países en desarrollo).

Estudio colaborativo FAO/CIAT sobre la estructura de la demanda de carnes en Brasil, Colombia, Venezuela, México, República Dominicana, Jamaica, Perú y Chile. Cubre los siguientes aspectos: descripción e interpretación histórica de la producción, consumo y comercio de carnes en la región, desde mediados de los años 60 hasta hoy; preferencias del consumidor y cambios en los patrones del consumo; comportamiento de la demanda en los países se-

leccionados; estructura futura de las carnes en los países seleccionados mediante proyecciones de oferta de demanda, así como demanda de granos para concentrados; políticas generales y específicas aplicadas al sector de carnes.

Botero, R. (Editor)

Manejo de Explotaciones Ganaderas en las Sabanas Bien Drenadas de los Llanos Orientales de Colombia

1989.100 páginas. 15 x 22 cm. Rústica. ISSN-0120-5943. Agotado.

Indica cómo mejorar la productividad de los hatos en este ecosistema mediante buen manejo de la sabana nativa, manejo adecuado de los animales, construcción de una infraestructura mínima, y cultivo de pequeñas áreas con pastos mejorados para uso estratégico, todo con un mínimo costo. Publicación dirigida a técnicos y ganaderos.

Estrada, R.D.; Sere, C. y Luzuriaga, H.

Sistemas de Producción Agrosilvopastoriles en la Selva Baja de la Provincia del Napo, Ecuador

1988.108 páginas. 15 x 22 cm. Rústica. ISBN-84-89206-78-3. \$5.00 (Países desarrollados), \$3.75 (Países en desarrollo).

Estudio efectuado en la Amazonia ecuatoriana para obtener información cuantitativa sobre sus sistemas de producción, sus características y limitaciones. Se hacen proyecciones sobre su evolución y se recomiendan líneas de investigación para mejorar los ingresos de los colonos y desarrollar la región sin riesgos ecológicos.

Aguirre, R. y Peske, S.T.

Manual para el Beneficio de Semillas

1988. 290 páginas. 20.5 x 24.5 cm. Folder argollado. ISBN-84-89206-75-9. \$12.50 (Países desarrollados), \$10.00 (Países en desarrollo).

Dirigido específicamente a jefes, supervisores y operadores de plantas de beneficio de semillas, este manual contiene información respecto a las operaciones involucradas en el secamiento, el acondicionamiento y el almacenamiento de semillas. Incluye recomendaciones prácticas, tablas y figuras de utilización diaria en la planta, y normas y procedimientos para adelantar un control interno de calidad en la planta de beneficio de semillas. Se dan algunos ejemplos para determinar los costos de beneficio.

Pérez-Crespo, C.A. (Editor)

Integrated Cassava Projects

1990. Not available yet.

It presents strategies for increasing socioeconomic development in the tropics, emphasizing farmer participation in cassava production, processing, and marketing activities.

Buitrago, J.A.

La Yuca en la Alimentación Animal

1990. En impresión.

Ofrece información básica y recomendaciones para el uso de raíces y otras partes de la planta de yuca (fresca, harina, ensilaje, 'pelets') en la alimentación de bovinos, porcinos y aves, según su etapa de producción. Como complemento presenta una serie de cuadros que resumen resultados obtenidos por diferentes investigadores en la materia.

Cock, J.H.

La Yuca, Nuevo Potencial para un Cultivo Tradicional

1989. 240 páginas. 15 x 22 cm. Rústica. ISBN 84-89206-82-1, \$15.00 (Países desarrollados). \$12.50 (Países en desarrollo).

Compendio de información práctica existente y experiencias del autor sobre la yuca, su producción, procesamiento, comercialización y usos, con énfasis en su potencial para nuevos mercados. Incluye tecnologías mejoradas, discute las condiciones para proyectos de desarrollo, y analiza ejemplos de logros y fracasos en programas de producción y utilización del producto. (Traducción de Cassava: New Potential for a Neglected Crop, editada por IADS y publicada por Westview Press, Boulder, Colorado, USA.)

Pérez-Crespo, C.A. (Editor)

Proyectos Integrados de Yuca

1990. No disponible aún.

Presenta estrategias para desarrollo socioeconómico en el trópico, dando énfasis a la participación del agricultor en las actividades de la producción, el procesamiento, y el mercadeo de la yuca.

Research Highlights

CIAT Publication Unit/Unidad de Publicación

CIAT Report/Informe CIAT

1990. ISSN 01 20-3169; ISSN 0120-3150. Distribución limitada/Limited distribution.

Actividades sobresalientes del CIAT en 1989, incluido un vistazo sobre la década de 1980 y los planes estratégicos para los 90.

Highlights of CIAT's activities in 1989 including an overview of activities in the 1980s and of the strategic plans for the 1990s.

CIAT Información Pública

CIAT Internacional

2 números por año. Páginas variables. 21 x 27.5 cm. Costura de alambre al caballete. ISSN 01 10-4084

Este boletín destaca las actividades y los resultados de la investigación del CIAT, y su impacto sobre el desarrollo agrícola.

CIAT Public Information

CIAT International

2 issues per year. Pages vary. 21 x 27.5 cm. Saddle stitched. ISSN 0120-4084

Newsletter highlighting CIAT's research activities and results and their impact on agricultural development.

CIP

**International Potato Center
Centro Internacional de la Papa
Centre International de la Pomme de Terre**

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Foreword

The International Potato Center (CIP) is a scientific institution established for the purpose of developing and disseminating knowledge for greater use of the potato and other root and tuber crops. The following publications are designed to support research and communication among agricultural programs around the world.

We recommend contacting your National Potato Program. It is authorized to distribute all publications and visual materials of CIP, and may also respond to other needs you may have concerning potato research or training.

Prefacio

El Centro Internacional de la Papa (CIP) es una entidad científica establecida para desarrollar y diseminar conocimientos sobre la papa y otros cultivos de raíces y tuberculos, con el propósito de lograr su mayor utilización. Las siguientes publicaciones han sido hechas para apoyar la investigación y comunicación entre los programas agrícolas en el mundo.

Le recomendamos que se comunique con su Programa Nacional de Papa. Este está autorizado para distribuir todas las publicaciones y materiales visuales del CIP y también puede responder a otras necesidades que usted tenga en relación con la investigación y la capacitación en papa.

Avant-propos

Le Centre International de la Pomme de Terre (CIP) est une institution scientifique qui a été établie a fin de développer et propager les connaissances sur la pomme de terre et autres cultures de racines et tubercules, dans le but d'atteindre leur utilisation optimale. Les publications suivantes ont été faites afin d'encourager la recherche et la communication entre les programmes agricoles du monde entier.

Aussi, nous vous recommandons de contacter votre Programme National de Pomme de Terre. Celui-ci est autorisé a distribuer toutes les publications et matériel visuel du CIP et est en mesure de répondre a d'autres besoins que vous pouriez avoir concernant la recherche et la formation en matière de pomme de terre.

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CIP's research and training activities during the year. List of CIP's board of directors, staff, donors, publications, funding.

Actividades de investigación y capacitación del CIP durante el año. Listas de los miembros de la junta directiva, el personal, los donantes, las publicaciones científicas, y fuentes de financiación.

English

Español

1988
1989

out of print 1988
1989

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Vol. 16, No. 3, 1988		
<ul style="list-style-type: none"> - Archaeological remains of potato and sweet potato in Peru - Restos arqueologicos de papa y camote (batata) en el Perú agotado - Fouilles et decouverte de vestiges archeologiques de pommes de terre et de patates douces au Pérou 		
Vol. 16, No. 4, 1988		
<ul style="list-style-type: none"> - Breeding strategies for true potato seed production - Estrategias de mejoramiento para la producción de semilla sexual de papa - Strategies d'amélioration pour la production de semences botaniques de pommes de terre 		
Vol. 17, No. 1, 1989		
<ul style="list-style-type: none"> - Boosting tuber-seed production in Brazil: Serological techniques and antiserum production 		

GERMPLASM MANAGEMENT	MANEJO DE GERMOPLASMA	GESTION DU GERMOPLASME
International Potato Center		US\$6.25
Improvement of sweet potato (ipomoea batatas) in East Africa, with some references of other tuber and root crops		
1988.208 p. 27.7 x 21.5 cm. Softcover. ISBN-92-9060-129-9.		
Report of the "Workshop on Sweet Potato Improvement in Africa", held at ILRAD, Nairobi, Kenya; UNDP Project CIAT-CIP-IITA, September 28-October 2, 1987; with recommendations and 25 articles on sweet potato crop in developing countries.		
International Potato Center		US\$6.25
Improvement of sweet potato Ipomoea batatas) in Asia		
1989. 256 p. 27.7 x 21.5 cm. Softcover. ISBN-92-9060-134-5		
Report of the "Workshop on Sweet Potato Improvement in Asia", held at ICAR, Trivandrum, India, and jointly sponsored by the international Potato Center (CIP), the Indian Council of Agricultural Research (ICAR), and the Central Tuber Crops Research Institute (CTCRI), October 24-28, 1988; with recommendations and 27 articles on sweet potato research.		
Wissar, R., Ortiz, R.		US\$ 1.25
Mejoramiento de papa en el CIP por adaptación a climas cálidos tropicales Gula de Investigaciòn CIP 22		
1988. 51 p. 27.7 x 21.5 cm. Cubierta simple.		
Golmirzaie, Ali M., Ortiz, R., Serquen, F.		US\$ 3.75
Genética y mejoramiento de la papa mediante semilla (sexual)		
1990. 35 p. 24.6 x 19.5 cm. Cubierta simple. ISBN-92-9060-139-6.		
Se discuten los progresos obtenidos en el área de la genética y el mejoramiento en semilla sexual de papa.		

SEED PRODUCTION	PRODUCCION DE SEMILLA	PRODUCTION DE SEMENCES
<p>Aguilar, J., Vittorelli, C.</p> <p>Disinfest planting substrate using methyl bromide to produce basic potato seed tubers in greenhouses</p> <p>1988. 11 p. 22.8 x 16.7 cm. Softcover. ISBN-92-9060-127-2.</p> <p>This booklet explains the method, endorsed by the National Potato Programme of the INIAA, Peru, for applying methyl bromide, and gives you various alternatives.</p>	US\$ 1.25	
<p>Benz, J.</p> <p>Producción y utilización de materiales para la siembra de papa en climas cálidos Gula de Investigación CIP 23</p> <p>1989. 38 p. 27.7 x 21.5 cm. Cubierta simple.</p>		US\$ 1.25
<p>Hidalgo, O. y, Rincón, H. (eds.)</p> <p>Avances en la producción de tubérculo-semilla de papa en los países del cono sur</p> <p>1989. 199 p. 27.6 x 21.5 cm. Cubierta simple. ISBN-92-9060-135-3.</p> <p>Documenta el uso de la tecnología moderna que ha permitido que estos países hayan reducido significativamente las importaciones de tubérculo-semilla de buena calidad.</p>	US\$ 6.25	
<p>Bryan, James E.</p> <p>Breaking dormancy of potato tubers CIP Research Guide 16</p> <p>1989. 12 p. 27.7 x 21.5 cm. Softcover.</p>	US\$ 1.25	
<p>Bryan, James E.</p> <p>Ruptura del reposo en los tubérculos de papa. Gula de investigación CIP 16</p> <p>1989. 15 p. 27.7 x 21.5 cm. Cubierta simple.</p>	US\$ 1.25	

International Potato Center US\$ 1.25

True potato seed/Semilla sexual de papa/Semence botanique de la pomme de terre. CIP Bibliography/Bibliografía CIP/Bibliographie CIP No. 24

1989. 70 p. 23.9 x 15.1 cm. Softcover.
ISSN 1013-8226.

**DISEASES
AND PESTS****ENFERMEDADES
Y PLAGAS****MALADIES ET
DEPREDATEURS**

Jayasinghe, U., Chuquillanqui, C. US\$ 1.25

Use of indicator plants for detection of potato viruses. CIP Research Guide 21

1989. 29 p. 27.7 x 21.5 cm. Softcover.

Aguilar, J., Vittorelli, C., Santisteban, O. US\$ 1.25
Low cost thermoherapeutic chamber for the eradication of potato viruses

1989. 17 p. 21.3 x 13.9 cm. Softcover.
ISBN-92-9060-1 33-7.

Explains how The National Potato Program of Peru with contributions from CIP-INIAA -COTESU contract, has developed a simple, practical, and low cost thermoherapeutic chamber and has demonstrated its efficiency in the eradication of potato viruses.

International Potato Center US\$ 1.25

Integrated pest management of potatoes/
Manejo integrado de plagas de papa/
Lutte intégrée en culture de pomme de terre
CIP Bibliography/Bibliografía CIP/
Bibliographie CIP No. 25

1989. 29 p. 23 x 15.7 cm. Softcover.
ISSN 1013-8226.

It includes 124 references entered until February 1989 and has been produced as an output from CIP's bibliographic database.

Aguilar, J., Viorelli, C., Molina, J.,
Santisteban, O.

US\$ 1.25

Desinfeste el sustrato de siembra por
el metodo de la solarización

1989. 18 p. 21.5 x 14 cm. Cubierta simple.
ISBN-92-9060-138-8.

Explica como el uso de la radiación solar
sirve como un agente letal para el control
de plagas y enfermedades mediante el uso de
polietileno transparente colocado sobre el
sustrato y la exposición a la luz del sol.

AGRONOMY**AGRONOMIA****AGRONOMIE**

Midmore, D.J.

US\$ 1.25

Fisiología de la planta de papa
bajo condiciones de clima cálido
Gula de Investigación CIP 24

1988. 15 p. 27.7 x 21.5 cm. Cubierta simple.

Midmore, D.J.

US\$ 1.25

Agronomía para la producción de
papa en climas cálidos
Gula de Investigación CIP 9

1989. 48 p. 27.7 x 21.5 cm. Cubierta simple.

Ekanayake, I.J.

US\$ 1.25

Studying drought stress and Irrigation
requirements of potatoes
CIP Research Guide 30

1989.40 p. 27.7 x 21.5 cm. Softcover.

**POST-HARVEST
TECHNOLOGIES****TECNOLOGIAS DE
POSCOSECHA****TECHNOLOGIE
DAPRESRECOLTE**

Werge, R.

US\$ 1.25

Sistemas de almacenamiento de
papa en la región del valle del
Mantaro (Perú)

1980. 45 p. Reimpresión 1989.
27.9 x 21.6 cm. Cubierta simple.

Booth, R., Shaw, R.
Principios de almacenamiento de
papa

1990. 116.p. 19.5 x 27.6 cm.
Cubierta simple.

Editorial Agropecuaria Hemisferio Sur
S.R.L. Centro Internacional de la Papa
Combina la información científica,
práctica y de ingeniería, con las
experiencias en almacenamiento
de papa, que los autores han tenido
en numerosos países.

Contacte la Editorial
Hemisferio Sur.
Ver dirección en
página 5

Gómez de Zea R., Wong, D.
Procesados de papa: Un mercado
potencial

1989. 103 p. 20.8 x 27.9 cm.
Cubierta simple.

Centro de Investigación,
Universidad del Pacífico (CIUP)
Av. Salaverry 2020
Lima 11, Perú

Este trabajo constituye un estudio
exploratorio de las características
y la dinámica del mercado de los
productos procesados de papa en
Lima Metropolitana.

Contacte el CIUP

SOCIAL SCIENCES	CIENCIAS SOCIALES	SCIENCES
FOOD SYSTEMS	SISTEMAS ALIMENTARIOS	SOCIALES
ALIMENTAIRES		SYSTEMES

Monares, A., Achata, A., Alvarez, J., Moreno, P. US\$ 2.50
Economía de la industria de semillas
en el Perú con énfasis en los cultivos
de papa y hortalizas

1988. 72 p. 27.9 x 21.6 cm.
Cubierta simple. ISBN-92-9060-126-4.

Se analizan aspectos socioeconómicos de
la semilla en el Perú a fin de lograr
un mejor entendimiento de los procesos
de producción, uso y comercialización
de este insumo.

Crissman, Ch. US\$ 2.50

**Seed potato systems in The Philippines:
A case study**

1989. 82 p. 27.9 x 21.6 cm. Softcover.
ISBN-92-9060-1 36-1.

This case study offer a comprehensive look at the important informal seed sector, the official seed programs, and the interaction among the various elements of the informal system, the official program and farmers.

Crissman, Ch.; Uquillas, J. E. US\$ 2.50

Seed potato systems in Ecuador: A case study

1989. 70 p. 27.9 x 21.6 cm. Softcover.
ISBN-92-9060-137-X.

Comprehensive study which document the structure and functions of seed potato programs. Given the complexity and the key role seed programs have in any country's potato improvement.

Scott, G. US\$ 6.25

**La pomme de terre en Afrique Centrale;
une étude sur le Burundi, le Rwanda
et le Zaire. CEDAF - ASDOC**

1 988. 235 p. 24 x 16.5 cm. Softcover.
ISSN 0250-1 61 9.

international Potato Center US\$ 2.50

**Potato production and constraints
in West and Central Africa: Overview
and planning strategies for the future
Report of the workshop held at Bamenda,
Cameroon September 25-30, 1988**

1989. 59 p. 27.9 x 21.6 cm. Softcover.

Rhoades, R. US\$ 1.25

**Understanding small farmers: Sociocultural
perspectives on experimental farm trials
Training Document 1982-3**

1982. 9 p. Reprint 1989. 27.9 x 21.6 cm.
Softcover.

- 1979- 1 Producción y utilización de la papa en el valle del Mantaro - Perú
Resultados de la encuesta agro-económica de visita única
Franco, E., Horton, D.
- 1980 - 4 Evaluación agro-económica de ensayos conducidos en campos de agricultores en el valle del Mantaro (Perú) campaña 1978/79.
Franco, E., Horton, D., Cortbaoui, R., Tardieu, F. y Tomassini, L.
- 1981- 1 Evaluación agro-económica de ensayos conducidos en campos de agricultores en el valle del Mantaro (Peru) campaña 1979/80.
Franco, E., Horton, D., Cortbaoui, R., Tomassini, L., Tardieu, F.
- 1982- 1 Farmer-back-to-farmer: A model for generating acceptable agricultural technology
Rhoades, R. and Booth, R.
- 1982-5 AIA: Un modelo conceptual, interdisciplinario, de tecnología agrícola apropiada.
Rhoades, R. y Booth, R.
- 1989- 1 Evaluation, choice and use of potato varieties in Kenya
Crissman, L.

TIB Slide Collections

Colecciones de Diapositivas TIB

20 Wiersema, S.

US\$ 38.75

- Physiological development of potato seed tubers
62 slides

- Desarrollo fisiológico de tubérculos-semillas de papa
62 diapositivas

22 Jayasinghe, U.

US\$ 36.25

- Potato leafroll virus; PLRV
58 slides

- El virus del enrollamiento de la hoja de la papa; PLRV
58 diapositivas

CIMMYT

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de Maiz y Trigo**

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General Information

Maize and wheat constitute the principal sources of carbohydrates and protein for nearly half of the people of the world. CIMMYT's primary objective is to improve the productivity of the human, natural, and institutional resources committed to maize and wheat, whether in national research systems or through them, at the farm level. Toward this end, CIMMYT implements research, training, and information programs designed to improve maize and wheat production in the developing countries of the world. The Center currently conducts research on maize, bread wheat, durum wheat, and triticale.

CIMMYT provides single copies of most of its publications free of charge to over 5,000 agricultural scientists and libraries in developing countries. Beyond this complementary distribution, CIMMYT employs a two-tiered pricing structure for its publications. Separate prices are listed in this catalog for Highly Developed Countries (HDCs) and Less Developed Countries (LDCs). All prices include airmail postage. CIMMYT reserves the right to adjust prices annually.

In addition, all CIMMYT publications are available on microfiche. If you are interested in this delivery format, please write for cost information and other details.

Annual Reports

CIMMYT Staff

CIMMYT Annual Reports 1987, 1988, and 1989

1987. *A Dialogue with the future* (theme: strategic planning). 91 pages. 21.5 x 28 cm. Saddle wire stitched. ISSN 02578735. Available in English and Spanish. HDC \$10.00, LDC \$4.00.

1988. *Delivering Diversity* (theme: genetic resources). 80 pages. 21.5 x 28 cm. Saddle wire stitched. ISSN 02578735. Available in English and Spanish. HDC \$10.00, LDC \$4.00

1989. *Beyond Subsistence: New Options for Asian Farmers* (theme: agricultural development in Asia). 72 pages. 21.5 x 28 cm. Saddle wire stitched. ISSN 02578735. Available in English and Spanish. HDC \$10.00, LDC \$4.00.

These annual reports are intended primarily for policy makers and members of the donor community. Each is oriented toward a theme or issue of abiding relevance for agricultural development. Part of this approach involves a "Point of View" essay by a recognized authority on the given theme. In addition, each provides a report from management, highlights of CIMMYT's maize, wheat, and economics re-

search programs, a summarized financial statement, a list of CIMMYT publications, and a list of current staff.

Monographs

CIMMYT Staff

Toward the 21st Century: CIMMYT's Strategy

1989.78 pages. 21.5 x 28 cm. Perfect bound. ISBN 968-6127-33-X. Available in English. HDC \$10.00. LDC \$4.00.

Targeted toward donors and members of the CGIAR Technical Advisory Committee (TAC), this document is the outcome of strategic planning conducted by CIMMYT in 1987-88. It describes the basic character, organization, and values of CIMMYT, as well as its place in the context of agricultural development. It also analyzes future developments in that context and their implications for the Center's work. Finally, it outlines basic strategic choices made by CIMMYT at the institutional and enterprise levels, along with the rationales for those decisions.

N.C. Russell

CIMMYT Today. Ghana's Tradition Makers: Changing Patterns in Food Crops

1989.31 pages. 21.5 x 28 cm. Saddle wire stitched. ISSN 0304-5447. Available in English, Spanish, and French. HDC \$6.00. LDC \$3.00.

This document presents an overview of Ghana's multiple cropping systems, which include among others maize, cassava, sorghum, and cowpeas. The work also analyzes the role of new technology and extension activities, especially on-farm research, in crop production and rural development. The support efforts of several national and international organizations in staff development, maize and grain legume improvement, and crop management are described.

K. Snowball and A.D. Robson

Nutrient Deficiencies and Toxicities In Wheat: A Guide for Field identification

1990.50 pages. 18 x 19 cm. Saddle wire stitched. ISBN 968-6127-48-8. Available in English and Spanish. HDC \$10.00. LDC \$4.00.

This field handbook is designed to help researchers identify nutrient deficiencies and toxicities resulting from impaired metabolism within the wheat plant.

A.P. Roelfs and R.P. Singh

The Rust Diseases of Wheat: Concepts and Methods of Disease Management

1990.120 pages. 21.5 x 28 cm. Saddle wire stitched. ISBN968-6127-47-X. HDC \$15.00. LDC \$5.00.

The rusts of wheat are among the most studied plant diseases. This practical manual reviews the scientific literature on rust pathogens to provide a single source of information for scientists and students. Detailed presentations are given on epidemiology, hosts, and pathogens for each type of rust. Methods of disease control (resistance, chemicals, and cultural methods) are discussed. The text also covers such topics as inoculum production, inoculation methods, disease scoring, testing for genes, and strategies for utilizing resistance.

CIMMYT Economics Program Staff

1987-88 CIMMYT World Wheat Facts and Trends. The Wheat Revolution Revisited: Recent Trends and Future Challenges

1989.57 pages. 21.5 x 28 cm. Saddle wire stitched. ISSN0257876X. Available in English and Spanish. HDC \$12.00. LDC \$6.00.

This issue is divided into three parts. Part 1 summarizes major trends in cereal production in the postwar period, analyzes wheat production according to moisture regime, discusses sources of yield increases in wheat in developing countries over the past decade, and assesses the possibilities for future increases in production and consumption. Part 2 provides an overview of the current world wheat situation. Part 3 assembles statistics on production, consumption, trade, and prices, among other aspects. It is suggested that future gains in productivity will depend on adopting a strategy somewhat different from that followed in the past: rather than relying chiefly on the interaction of improved germplasm, fertilizer, and irrigation, productivity in both favored and marginal areas could be raised by increasing the efficiency with which current technology is used.

CIMMYT Economics Program Staff

1989-90 CIMMYT World Maize Facts and Trends, Realizing the Potential of Maize In SubSaharan Africa

1990.70 pages. 21.5 x 28 cm. Saddle wire stitched. ISSN0257-876X. Available in English. HDC \$12.00. LDC \$6.00.

The feature report in this issue of World Maize Facts and Trends, prepared with the collaboration of IITA, reviews major maize production trends, technologies, and consumption patterns; identifies key constraints; and points out possible avenues for improving the

productivity of resources devoted to maize production and research. It concludes that maize, perhaps more than any other crop, has the potential to eliminate chronic food deficits in sub-Saharan Africa. The feature on Africa is followed by a summary of the world maize outlook and statistical tables containing information on maize production and trade for all major maize producing and consuming nations.

R. Tripp and J. Woolley

The Planning Stage of On-Farm Research: Identifying Factors for Experimentation

1989. 85 pages. 18 x 26 cm. Perfect bound. ISBN 968-6127-02-X. Available in English and Spanish. HDC \$15.00. LDC \$6.00.

Designed for researchers, extension agents, or training course coordinators, this publication presents six steps for assigning priorities to factors in experiments that are planted in farmers' fields (the actual design of experiments is not discussed). For each step there is a description of objectives, activities involved, and the relation to other steps. The descriptive sections are complemented by an example based on data from a hypothetical research area. The book also explains how the planning of on-farm experiments can be used to identify other activities in support of on-farm research.

P.W. Helsey, Editor

Research Report. Transferring the Gains from Wheat Breeding Research and Insuring Against Rust Losses in Pakistan

1990. 110 pages. 17.5 x 25 cm. Perfect bound. ISBN 968-6127-40-2. ISSN 0188-2466. Available in English with executive summary in Spanish and French. HDC \$10.00. LDC \$4.00.

This publication is the first in a new series, directed toward technical audiences, that synthesizes the results of CIMMYT research conducted over an extended period. This report describes work done by CIMMM scientists and their colleagues in Pakistan. Their investigation focused on slow wheat varietal turnover and related problems that have gradually increased the risk of serious rust epidemics in Pakistan. The authors present empirical data on the sources of seed that farmers grow, on how farmers gain access to seed sources, and on how farmers manage wheat seed once they obtain it. The publication identifies the varieties that farmers actually plant and analyzes farmers' motives for changing varieties. The report also presents a model for determining optimum rates of varietal turnover. By showing just how each part of the breeding and seed production, distribution, and adoption process functions in Pakistan and by indicating now more appropriate policies could make the process more efficient, the authors reveal both the complexity and urgency of the varietal turnover problem.

M.L. Morris

CIMMYT Economics Paper No. 1. Determining Comparative Advantage Through DRC Analysis: Guidelines Emerging from CIMMYT's Experience

1990. 42 pages. 17.5 x 25 cm. Perfect bound. ISSN 0188-2414. Available in English. HDC \$7.00. LDC \$3.00.

First in a new series, this paper will be of interest to administrators in national agricultural research systems. Using examples drawn from a series of case studies conducted over the past five years by the CIMMYT Economics Program, it first describes the basic methodology of domestic resource cost analysis (DRC), addressing a number of practical and conceptual problems commonly encountered in applying this framework for empirically measuring comparative advantage. The paper then summarizes lessons learned over the years at CIMMYT and evaluates DRC as a tool for applied policy analysis and research resource allocation.

J. Carney

CiMMYT Economics Paper No. 2. Triticale Production in the Central Mexican Highlands: Smallholders' Experiences and Lessons for Research

1990. 110 pp. 17.5 x 25 cm. Perfect bound. ISSN 0188-2414. Available in English and Spanish. HDC \$7.00. LDC \$3.00.

This paper examines the triticale utilization patterns of smallholders in the central Mexican highlands, where farmers have cultivated triticale for over 20 years. The case study elucidates several factors important to the design of appropriate and sustainable technologies for smallholders. First, indigenous knowledge of microenvironments with different edaphic and moisture properties provides the basis for on-farm crop experimentation. Second, this experimentation is often geared to the needs of an agropastoral system, which is crucial to rural livelihood and welfare. The crop-livestock components of the farming system permit smallholders to adjust their subsistence and marketing strategies to social and economic change. In the central Mexican highlands, it is the knowledge of triticale's uses rather than any specific food grain variety developed by researchers that has maintained triticale in the farming system. This case study concludes that an interdisciplinary research framework building on the best of traditional agricultural practices, is pivotal to the design of appropriate technologies for smallholders.

Pakistan Agricultural Research Council/CIMMYT

Wheat Research and Development In Pakistan

1989. 129 pages. 17.5 x 25 cm. Perfect bound. ISBN968-6127-31-3. Available in English. HDC \$12.00. LDC \$8.00.

This book presents an overview of Pakistan's agricultural sector and identifies the developments that contributed to its wheat revolution. It provides an account of wheat economy trends between 1964 and 1987 and identifies the major factors responsible for the growth and development of that economy. The evolution and contributions of the national wheat research system are traced forward, starting with colonial times. It presents a summary of recent research data for the major crop rotations in which wheat is grown and provides the current best recommendations for increasing national wheat productivity in the near term. Comments about Pakistan's institutional framework for wheat research and about the ways this system might be further strengthened are included. Special attention is given to the collaboration between Pakistani research institutions and CIMMYT.

Pakistan Agricultural Research Council/CIMMYT

Maize Research and Development in Pakistan

1989. 100 pages. 17.5 x 25 cm. Perfect bound. ISBN 968-6127-36-4. Available in English. HDC \$12.00. LDC \$6.00

This book presents an overview of Pakistan's agricultural sector and describes the role of maize production in that country. It provides an account of maize economy trends between 1975 and 1986 and gives a detailed description of the major maize growing environments in Pakistan. The evolution and present state of maize research there and of the country's maize research system are outlined, along with the contributions of CIMMYT. Finally, the publication identifies the principal constraints to national maize productivity and recommends ways to improve productivity in the near term.

CIMMYT Staff

Seed Conservation and Distribution: The Role of the CIMMYT Wheat Germplasm Bank

1990. 20 pages. 15.5 x 22.5 cm. Saddle wire stitched. ISBN 968-6127-49-6. Available in English, Spanish, and French. No charge.

This publication describes the types of materials contained in the CIMMYT wheat germplasm bank, explains the steps involved in obtaining seed from the bank, and offers suggestions on the handling of that seed.

CIMMYT Staff

Norman E. Borlaug: Bibliography

1988.52 pages. 14 x 22.5 cm. Saddle wire stitched. ISBN 968-6127-27-5. HDC \$3.00. LDC \$1.00.

This work lists the Borlaug papers and publications that are available in CIMMYT's Scientific Information Unit (SIU). They are listed by subject and year using the classification of the International Information System for Agricultural Sciences and Technology (AGRIS).

CIMMYT Staff

Semidwarf Bread Wheats: Names, Parentages, Pedigrees, and Origins

Revised 1988.42 pages. 10 x 18 cm. Saddle wire stitched. ISBN 968-6127-003. Available in English and Spanish. HDC \$3.00. LDC \$1.00.

Designed to assist wheat researchers, this publication compiles information on all semidwarf bread wheat cultivars and advanced lines produced by CIMMYT and the Mexican National Institute of Agricultural Research (INIFAP); it also contains the names and pedigrees of cultivars with CIMMYT parentage that have been released since 1962 by cooperating national programs.

CIMMM Economics Program Staff

Economics Working Papers

HDC \$3.00. LDC \$1.00.

J. Lonamire and J. Lugogo

The Economics of Small-Scale Wheat Production Technologies for Kenya. 1989.

R. Tripp, P. Anandajayasokoram, and G. Sain

The Design and Management of Call System Training In On-Farm Research. 1990.

J.P. Bronnan and E.J. Warham

Economic Losses from Karnal Bunt of Wheat In Mexico. 1990.

R. Echovorra

Public and Private Investments in Maize Research in Mexico and Guatemala. 1990.

Proceedings

S.R. Waddington, A.F.E. Palmer, and O.T. Edje, Editors

Research Methods for Cereal/Legume Intercropping: Proceedings of a Workshop on Research Methods for Cereal/Legume Intercropping in Eastern and Southern Africa

1990.21.5 x 28 cm. Paperback. Perfect bound. Available in English. HDC \$15.00. LDC \$6.00.

A workshop on research methods for cereal/legume intercropping was held, under the sponsorship of CIMMYT, CIAT, and the government of Malawi, in response to strong interest on the part of national research and extension services in eastern and southern Africa. Its purpose was to help make intercropping research more effective and more relevant to the needs of smallholder farmers. Held on 23-27 January 1989, the workshop was attended by about 70 persons, including agronomists and other researchers from the region and several researchers working on intercropping outside the region. Twenty-five papers were presented in five sessions, covering 1) the future of intercropping research and implications for research methods, 2) understanding current intercropping patterns and diagnosis of intercropping problems in farmers' fields, 3) development of an intercropping research program and component research, 4) experimentation with intercrops, and 5) analysis and interpretation of intercrop research. There was also a special session on country experience in intercropping research.

N.W. Simmonds and S. Rajaram, Editors

Breeding Strategies for Resistance to the Rusts of Wheat: Proceedings of an international Workshop

1988.151 pages. 17 x 24 cm. Perfect bound. ISBN968-6127-23-2. Available in English with abstracts in English, Spanish, and French. HDC \$15.00. LDC \$6.00.

This publication features nine invited papers that focus on stem rust, leaf rust, and stripe rust in wheat and discuss the role of specific genes, diversity, and use of polygenic, partial, and durable resistance. A tenth paper summarizes the discussions within the context of defined breeding strategy.

CIMMYT Staff

Recent Advances in the Conservation and Utilization of Genetic Resources: Proceedings of the global Maize Germplasm Workshop

1989. 184 pages. 21.5 x 28 cm. Perfect bound. ISBN968-6127-44-5. Available in English. HDC \$15.00. LDC \$6.00.

Sponsored jointly by Mexico's National Institute of Forestry, Agriculture, and Livestock Research (INIFAP) and CIMMYT with support from the United Nations Development Programme (UNDP), the Technical Centre for Agricultural and Rural Cooperation (CTA) of The Netherlands, IBPGR, and Pioneer HI-Bred international, the workshop was held at CIMMYT headquarters March 6-12, 1988. The papers cover such aspects as the collection, classification, and characterization of maize germplasm, in addition to bank management, wild relatives, seed storage, racial diversity, and germplasm regeneration. Country reports are given, along with conclusions and recommendations.

CIMMYT Maize Program Staff

Toward Insect Resistant Maize for the Third World: Proceedings of the International Symposium on Methodologies for Developing Host Plant Resistance to Maize Insects

1989.327 pages. 21.5 x 28 cm. Perfect bound. ISBN 968-4327-35-6. Available in English with abstracts in English, Spanish, and French. HDC \$20.00. LDC \$8.00.

The symposium took place at CIMMYT headquarters March 9-14, 1987, under the joint sponsorship of CIMMYT, the United Nations Development Programme (UNDP), the German Agency for Technical Cooperation (GTZ), and the United States Agency for International Development (USAID). Designed to assist developing country researchers or to serve as reference text for agriculture students and professors, the proceedings contains a wealth of detailed information and extensive illustrations on the whole range of rearing, infesting, and breeding methodologies.

A. Mujaab-Kazi and L.A. Sitch, Editors

Proceedings of the 2nd International Symposium on Genetic Manipulation in Crops, August 28-31, 1988

1990.372 pages. 21.5 x 28 cm. Perfect bound. ISBN 968-6127-34-8. Available in English with abstracts in English, Spanish, and French. Contact CIMMYT about pricing.

This work presents 30 invited papers from a symposium held with support from the United Nations Development Programme (UNDP), the Rockefeller Foundation, the United States Agency for International Development (USAID), and the Third World Academy of Sciences. The articles report on current field work and review the literature in four specific areas: 1) anther culture and haploid breeding; 2) protoplast culture, somatic hybridization, and transformation systems; 3) distant hybridization; 4) somatic embryogenesis and somaclonal variation. Research needs are discussed, along with

ways to develop the collaborative mechanisms necessary for further progress in these areas of investigation.

M.M. Kohli and S. Rajaram, Editors

Wheat Breeding for Acid Soils: Review of Brazilian/CIMMYT Collaboration, 1974-1986

1988.67 pages. 21.5 x 28 cm. Saddle wire stitched. ISBN 968-4127-26-7. Available in English. HDC \$6.00. LDC \$3.00.

The outcome of a workshop held in Brazil August 13-15, 1986, the papers in this proceedings evaluate the results of over a decade's collaboration between CIMMYT and Brazilian research institutions and describe plans for future efforts. The nature of acid soil constraints are outlined, breeding methodologies discussed, and extensive listings of acid-soil tolerant wheats provided.

P.A. Burnett, Editor

World Perspectives on Barley Yellow Dwarf

1990.511 pages. 17.5 x 26 cm. Perfect bound. ISBN 968-6127-39-9. Available in English. HDC \$20.00. LDC \$8.00.

Proceedings of an International Workshop held July 6-11, 1987 in Udine, Italy, the work contains 98 invited and contributed papers that describe current work on this virus disease in four areas: 1) world situation; 2) virology, 3) ecology and epidemiology, and 4) control. The articles also discuss study and control techniques.

D. Saunders, Editor

Wheat for the Nontraditional Warm Areas: Proceedings of the International Conference, July 29-August 3, 1990, Foz do Iguacu, Brazil

1991. 17 x 24 cm. Perfect bound. ISBN 968-6127-46-1. Available in English with abstracts in English, Spanish, and Portuguese. HDC \$12.00. LDC \$5.00.

This conference was hosted by CIMMYT and funded by the United Nations Development Programme (UNDP). The proceedings includes forward looking papers and posters that summarize present knowledge in the field and suggest where major gains can be made in the future. Additional papers review the current status of wheat crop breeding, disease research, and crop management in tropical areas.

IBPGR

International Board for Plant Genetic Resources

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General Information

The International Board for Plant Genetic Resources is dedicated to improving the standard of living of the peoples of the world. It accomplishes this in two ways: through the support and promotion of a global network for the collection and conservation of crop genetic resources; and by sponsoring and carrying out relevant research.

IBPGR Publications 1989/90

The information on titles/series numbers supersedes that published in earlier catalogues. IBPGR publications are available free of charge from the Publications Office at IBPGR Headquarters to the libraries of genebanks, university departments, research institutions, etc. On request to the IBPGR Publications Office, limited numbers of titles may also be made available to individuals who can show that they have a need for a personal copy of a publication.

FAO/IBPGR Plant Genetic Resources Newsletter

Quarterly. 48 pages. A4. Paper.

This Newsletter publishes several types of paper. Articles reporting significant new developments within the field of plant genetic resources are subject to strict refereeing procedures. Collecting articles report recent collecting missions. News items give information on recent developments.

IBPGR Regional Newsletters

These informal Newsletters report on recent developments of regional interest. There are four of them, appearing 2-4 times per year:

IBPGR Newsletter for Sub-Saharan Africa (2 versions; English and French)

IBPGR Newsletter for Europe, Southwest Africa and North Africa

IBPGR Newsletter for Asia and the Pacific (2 versions; English and Chinese)

IBPGR Newsletter for the Americas (2 versions; English and Spanish)

Geneflow

Annual. 16 pages. A4 (Approx.) Paper.

A colorful magazine of plant genetic resources aimed at the donor community, the wider scientific audience and the informed public.

Glossary of Plant Genetic Resources Terms

1990. 130 pages. 85. In press.

To be published commercially, this Glossary defines 1500 terms, in English, related to the subject area.

Directories of Germplasm Collections

- 1.1 Food Legumes
- 3. Cereals
- 4. Vegetables
- 5.11 Industrial Crops
- 6.11 Temperate Fruits and Tree Nuts

Descriptors

Aubergine (French)

Beta

Brassica and Raphanus

Mango

Pineapple

Xanthosoma

Chickpea

Revised (IBPGR/ICARDA/ICRISAT - in press)

Groundnut

Revised (IBPGR/ICRISAT - in preparation)

Maize

(Spanish/English/French - CIMMYT/IBPGR)

Pearl Millet

Revised (IBPGR/ICRISAT - in preparation)

Pigeon Pea

(IBPGR/ICRISAT-in preparation)

Sorghum

Revised (IBPGR/ICRISAT -in preparation)

FAO/IBPGR Technical Guidelines for the Safe Movement of Germplasm

Cassava

Citrus

Cocoa

Edible Aroids

Legumes

Musa

Sweet Potato

Yam

Systematic and Ecogeographic Studies on Crop Genepools

(Revised format)

I. Geric et al.

Races and Populations of Maize in Yugoslavia. isozyme Variation and Genetic Diversity

1989. Vol. 3. 108 pages. B5. Paperback.

J.A. Edmonds

Herbarium Survey of African Corchorous L Species

1990. Vol. 4. 250 pages (approx). B5. Paperback.

G.P. Nabhan

Wild Phaseolus Ecogeography In the Sierra Madre Occidental, Mexico: Areographic Techniques for Targeting and Conserving Species Diversity

1990. Vol. 5. 40 pages (approx). 55. Paperback.

J.A. Edmonds

The Distribution of Hibiscus L section Furcaria in Tropical East Africa

1990. Vol. 5. 100 pages (approx). B5. Paperback.

E.A. Benson

Free Radical Damage in Stored Plant Germplasm

1990. 128 pages. B5. Paperback.

This report examines the implications of free radical activity for safe conservation of plant genetic resources. Damage mediated by free radicals may make an important contribution to the net deterioration suffered by stored plant material.

International Crop Network Series

No. 1. Report of an International Barley Working Session

No. 2. Report of a Workshop on the Genetic Resources of Wild Arachis Species

No. 3. Report of an International Beta Genetic Resources Workshop

ICARDA

**International Center for Agricultural
Research in the Dry Areas**

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Telex : (0492) 331206, 331208, 331263 ICARDA SY

General Information

Objectives

To improve the agricultural systems and major food crops of the drier regions of Western Asia and North Africa. Mediterranean-type of climate of cool, moist winter and hot, dry summers, and the high elevation plateaux, with extremes of winter cold and summer heat, and snow cover for up to five months a year.

P.S. Cocks, E.F. Thomson, K. Somel, and A. Abd El-Moneim

Degradation and rehabilitation of agricultural land in North Syria

ICARDA-119 Ar, En: 38 pp.

A. Matar, P.N. Soltanpour, and A. Chouinard (editors)

Soil test calibration in West Asia and North Africa: proceeding of the second regional workshop, Ankara, Turkey, 1-6 September 1987

ICARDA-120 En: 118 pp.

Amelioration des legumineuses alimentaires en Afrique du Nord. Synthese des travaux du stage de formation, Tunis, 13-20 Avril 1986

ICARDA-123 Fr: 122 pp.

A.J.G. van Gastel and J. Kerley (editors)

Quality seed production: papers presented at the seed technology course, Cairo, Egypt, 15-30 March 1986

ICARDA-124 En: 185 pp.

M. Abdelnour

Meteorological reports for ICARDA experiment stations in Syria: 1986/87 season

ICARDA-125 En: 150 pp.

Genetic resources program: annual report **1987**

ICARDA-133 En: 57 pp.

Food legume improvement program: annual report 1987

ICARDA-134 En: 264 pp.

M.C. Saxena, R.A. Sikora, and J.P. Srivastava (editors)

Nematodes parasitic to cereals and legumes in temperate semi-arid regions: proceedings of a workshop held at Larnaca, Cyprus, 1-5 March 1987

ICARDA-135 En: 217 pp.

J.P. Srivastava, M.C. Saxena, S. Varma, and M. Tahir (editors)

Winter cereals and food legumes in mountainous areas: proceedings of an international symposium on problems and prospects of winter cereals and food legumes production in the high-elevation areas of West Asia, Southeast Asia, and North Africa, 6-10 July 1987, Ankara, Turkey

ICARDA-136 En: 317 pp.

Cours de formation sur les legumineuses alimentaires: experimentation et vulgarisation. Synthese des travaux, Meknes, Maroc, 7-12 mars 1988

ICARDA-137Fr: 116 pp.

High-elevation research in Pakistan: the MART/AZR project annual report 1988

ICARDA-138 En: 83 pp.

Meteorological reports for ICARDA experiment stations in Syria: 1987/88 season

ICARDA-139 En: 152 pp.

J. Michael

Barley rotation trials at Tel Hadya and Breda stations. A summary of biological yield data 1981-87

ICARDA-140 En: 30 pp.

Seed production project annual report 1988

ICARDA-141 En: 21 pp.

Farm resource management program annual report 1988

ICARDA-142 En: 205 pp.

Genetic resources program annual report 1988

ICARDA-143 En: 54 pp.

Pasture, forage, and livestock program annual report 1988

ICARDA-144 En: 284 pp.

Cereal Improvement program annual report 1988

ICARDA-145 En: 187 pp.

Food legume improvement program annual report 1988

ICARDA-146 En: 363 pp.

Verification and adoption of wheat production technology in farmer's field in the Sudan: proceedings of the third coordination meeting, 4-6 September 1988, Wad Medani, Sudan

ICARDA-147 En: 54 pp.

E.F. Thomson, F.A. Bahhady, and A. Martin

Sheep husbandry at the cultivated margin of the North-West Syrian steppe

ICARDA-148 En: 104 pp.

A.J.G. van Gastel, S. Varma, and S. A. Elah Hamood (editors)

Seed production in the Arabian Peninsula: proceedings of the workshop on seed production in the Arabian Peninsula, 16-18 March 1988, Sana'a, YAR, and selected papers presented at the general seed production course, 13-31 March 1988, Dhamar, YAR

ICARDA-149 En: 76 pp. (also Ar, 86 pp.).

J.D.H. Keatinge and K. Somel

Agronomic management and economic interpretation of small plot crop rotation trials in Northern Syria

ICARDA-150 En: 28 pp.

Regional program for barley and wheat research training in the Arabian Peninsula: proceedings of the first regional coordination meeting of barley and wheat scientists in the Arabian Peninsula, 18-20 October 1988, Sana'a, Yemen Arab Republic

ICARDA-151 Ar, En: 80 pp.

W. Sarraj (editor)

Genetic resources of range and forage plants: proceedings of the second Arab training course on plant genetic resources in dry areas, sponsored by IBPGR, ICARDA, and ACSAD, 21 March-11 April 1988, Aieppo, Damascus, Syria

ICARDA-152 Ar, 217 pp.

Sustainable agriculture for the dry lands: iCARDA's strategy

ICARDA-153 En: 118 pp.

Medium-term plan 1990-1994: consolidation and change

ICARDA-154 En: 149pp.

N. Fadda

Sustainable agriculture for the dry lands. ICARDAs strategy and medium-term plan. A presentation at centers week 1989, Washington DC, USA

ICARDA-155 En: 35 pp.

International food legume testing program on lentil, faba bean and kabuli chickpea

ICARDA-156 En: 20 pp.

Technical Manuals

P. Williams, F.J. El-Haramein, H. Nakkoul, and S. Rihawi

Crop quality evaluation methods and guidelines

14 (Rev.1) En: 145 pp,

Forage production under irrigation

Technical Manual No. 16 En: 73 pp.

Periodicals

Faba bean in AGRIS

Vol3 1987 (Cumulation), 53 pp., Vol4 1988, no. 1, 22 pp., No. 2, 21 pp., no. 3, 29 PP.

FABIS Newsletter

No. 18, 44 pp., no. 19, 36 pp., no. 20, 56 pp. no. 21, 52 pp.

LENS Newsletter

Vol 13, no. 2, 45 pp., Vol 14, no. 112, 38 pp., Vol 15, no. 1, 52 pp.

Lentil In AGRIS

Vol 1 1975-1985, 66 pp., Vol 2 1986-87, 41 pp.

RACHIS Newsletter

Vol 6, no. 1, En, 59 pp., Ar, 59 pp., Vol 6, no. 2, En, 64 pp., Ar, 68 pp.

ICARDA quarterly progress report

no. 1/89, 17 pp., no. 2/89, 19 pp., no. 3/89, 5 pp.

Faba bean In AGRIS

Vol 4 1988 (Cumulation), 49 pp., Vol 5 1989, nos. 1/2, 34 pp.

Lentil in AGRIS

Vol 3 1988, 26 pp.

FABIS Newsletter

No. 22, 56 pp., no. 23, 52 pp., no. 24, 52 pp.

LENS Newsletter

Vol 15, no. 2, 44 pp., Vol 16, no. 1, 54 pp.

RACHIS Newsletter

Vol 7, nos. 1/2, En, 68 pp., Vol 8, no. 1, En, 34 pp.

Other Publications

**Annual report for the regional barley yield trials
and observation nurseries**

1986/87. 215 pp.

**Annual report for the regional bread wheat yield trials
and observation nurseries**

1986/87. 163 pp.

**Annual report for the regional durum wheat yield trials
and Observation nurseries**

1986/87. 204 pp.

Barley germplasm catalog Part II

1988. 221 pp.

**Checklist: books, reports and journals published
outside ICARDA**

1973-88. 12 pp.

Chickpea pathology progress report

1987/88. 36 pp.

Faba bean germplasm catalog: pure line collection

140 pp.

Faba bean pathology progress report

1986/87. 150 pp.

ICARDA Annual Report 1987

76 pp. En. 80 pp. Ar.

**International cereal nurseries 1988-89:
list of cooperators and distribution of nurseries**

40 pp.

**international nursery report no. 10. Food legume
nurseries**

1985-1986.525 pp.

**Nile valley project on report on faba bean: report of the
ninth annual coordination meeting, 19-22 September
1988, Cairo, Egypt**

59 pp.

ICARDA in the news 1988

88 pp.

Journal Articles from ICARDA: Supplement 1988

8 pp.

Faba bean pathology progress report 1987-88

26 pp.

**Studies on nematodes of food legumes. Progress
report 1986/87**

16 pp.

Studies on nematodes of food legumes. Progress report 1987-88

15pp.

Report of the third food legume coordination meeting, Rabat, Morocco, 26-27 September 1988

34 pp.

Collaborative research project report on fertilizer use on barley in Northern Syria

1987/88.63 pp. (Ar/En).

Collaborative research project report on fertilizer use on wheat in Northern Syria

1986-1988. 116pp. (Ar/En).

Pasture, forage, and livestock program: preschedules for 1988-89 season

123pp.

Farm resource management program: core research and training plans 1988/89 season

77PP.

Collaborative research and training program: annual report 1987-88 season

377 pp. (Ar).

International nursery report no. 11. Food legume nurseries 1986-1987

506 pp.

ICARDA annual report 1988

117 pp. En. 114 pp. Ar.

Annual report for the regional durum wheat nurseries 1987-88

254 pp.

Annual report for the regional bread wheat nurseries 1987-88

259 pp.

Annual report for the heat tolerance observation nurseries 1987-88

22PP.

Annual report for the International barley nurseries 1987-88

246 pp.

International cereal nurseries 1989/90. List of cooperators and nursery distribution

33 pp.

ICARDA library catalogue of serials holding 1989

60 pp.

Progress report on the recommendations of 1988 external program and management reviews

25 pp.

MART/AZR project publications

Kn. Atiq-ur-Rehman, N.M. Khan, M. Asghar, and M.I. Sultani

Fourwing saltbush forage compared with conventional feeds for yearling sheep

Research Report no. 16: 9 pp.

Kn. Atiq-ur-Rehman, M. Munir, and B.R. Khan

incidence of internal parasites of sheep In upland districts of Baluchistan

Research Report no. 18: 17 pp.

M.A. Masood, M. Afzal, J.G. Nagy, and S.M. Khan

Agricultural and related statistics of upland Baluchistan

Research Report no. 20: 116 pp.

A. Ali, J.D.H. Keatinge, and B.R. Khan

introduction, selection and evaluation of annual sown forage legumes under continental Mediterranean climatic conditions in Pakistan

Research Report no. 21 : 8 pp.

R.S. Aro, M.I. Sultani, and M. Asghar

Introduction to fourwing saltbush (*Atriplex canescens*) into degraded rangelands in upland Baluchistan

Research Report no. 22: 9 pp.

J.D.H. Keatinge, B.R. Khan, D.J. Rees, R.S. Aro, and C. Talug

A strategic plan for the PARC Arid Zone Research Institute 1990-2000

Research Report no. 23: 22 pp.

D.J. Rees, F. Rehman, A. Samiullah, J.G. Nagy, G.F. Sabir, J.D.H. Keatinge, and S.H. Raza

Barley production under suboptimal conditions in upland Baluchistan: agronomic and socio-economic considerations

Research Report no. 24: 26 pp.

J.D.H. Keatinge, B.R. Khan, C. Talug, R.S. Aro, and D.J. Rees

Dryland agriculture in upland Baluchistan: the potential for improvement through effective research and extension

Research no. 25: 16 pp.

J.G. Nagy, G.F. Sabir, N.A. Shah, M. Afzal, D.J. Rees, and J.D.H. Keatinge

Barley production and its scope for improvement in the high elevation rainfed farming systems of Baluchistan

Research Report no. 26: 44 pp.

Kn. Atiq-ur-Rehman, R.S. Aro, M. Asghar, and M.I. Sukani

Effect of the flushing and late-gestation supplementary feeding on fertility and productivity of Harnai ewes

Research Report no. 27: 11 pp.

J.G. Nagy, G.F. Sabir, and J.M. Stubbs

Descriptive and diagnostic studies of sheep and goat production in the farming systems of upland Baluchistan

Research Report no. 28: 23 pp.

S. Ahmad, B.R. Khan, J.D.H. Keatinge, and A. Ali

The potential of new barley varieties in the high elevation dryland of Baluchistan

Research Report no. 29: 19 pp.

C. Talug, C. del Castillo, M.B.A. Chowdry, A. Ali, G.F. Sabir, and M. Islam

The scope for Improved agricultural extension in the dryland farming areas of upland Baluchistan

Research Report no. 30: 98 pp.

D.J. Rees, M. Islam, A. Samiullah, Z. Qureshi, S. Mehmood, F. Rehman, J.D.H. Keatinge, H. Raza, and B.R. Khan

Water harvesting and nitrogen fertilizer application as a means of Increasing crop water use efficiencies in suboptimal conditions in upland Baluchistan

Research Report no. 31 : 10 pp.

J.D.H. Keatinge, A. Ali, B.R. Khan, A.M. Abd El Moneim, and S. Ahmed

Germplasm selection strategy under environmental conditions marginal for crop growth: the example of annual forage legumes in upland Baluchistan

Research Report no. 32: 21 pp.

J.D.H. Keatinge and S. Sheierling

ICARDA cereals research in the highlands 1980-85

Research Report no. 33: 38 pp.

J.D.H. Keatinge, B.R. Khan, R.S. Aro, C. Talug, and D.J. Rees

Development plan for the Arid Zone Research Institute

Research Report no. 34: 14 pp.

J.G. Nagy, J.M. Stubbs, and E.R. Mallorie

Ex-ante economic technology evaluation for research and extension program design: sheep production improvement In Baluchistan

Research Report no. 35: 21 pp.

A. Ali and S. Ahmed

**Germplasm evaluation in the arid highlands
of Baluchistan: annual report 1987/88**

Research Report no. 36: 43 pp.

Kn. Atiq-ur-Rehman, S. Rafique, and R.S. Aro

**Fourwing saltbush as a winter maintenance forage for
sheep in upland Baluchistan**

Research Report no. 37: 18 pp.

C. Talug, M.B.A. Chawdry, A. Ali, and M. Islam

Linking agricultural research and extension

Research Report no. 38 (Rev): 17 pp.

D.J. Rees, S. Samiullah, F. Rehman, C.H.R. Kidd, J.D.H. Keatinge,
and S.H. Raza

**Precipitation and temperature regimes in upland Baluchistan:
their influence on dryland crop production**

Research Report no. 39: 20 pp.

D.J. Rees, Z.A. Qureshi, S. Mehmood, F. Rehman, and S.H. Raza

**Catchment basin water harvesting as a means of
improving the productivity of rainfed land in upland
Baluchistan**

Research Report no. 40: 18 pp.

Nile Valley Regional Program (NVRP) publications

Workshop, Egypt 1988-1989

ICARDA/NVRP-DOC-001: 21 pp.

Workshop, Sudan 1988-1989

ICARDA/NVRP-DOC-002: 31 pp.

Workplan and budget, Ethiopia 1989

ICARDA/NVRP-DOC-003: 46 pp.

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General Information

ICRISAT is one of 13 international centers in a worldwide research network devoted to improving food production in less developed countries. ICRISAT's mandate is to improve the yield, stability, and food quality of five crops basic to life in the semi-arid tropics (SAT) and to develop farming systems that will maximize use of the human and animal resources and the region's limited rainfall.

The SAT are spread over nearly 20 million square kilometers and include 50 nations in Asia, Australia, Africa, and Latin America. The SAT is a harsh region of limited, erratic rainfall and nutrient-poor soils. It is populated by over 750 million people, most of whom live at subsistence levels and depend on the limited production of small farms.

The crops researched by ICRISAT are the major cereals in the SAT--sorghum and millets--and the most important food legumes of the region--chickpea, pigeonpea, and groundnut. Groundnut, which is rich in oil, is an important cash crop for the SAT farmer, the others are primarily subsistence food crops.

ICRISAT's headquarters are at Patancheru, 26 km northwest of Hyderabad, India. Scientific staff are also posted in six African countries, Kenya, Malawi, Mali, Niger, Nigeria, and Zimbabwe, in Mexico, and Syria, and at four cooperative research stations in India. The two main bases for ICRISAT's work in Africa are at the ICRISAT Sahelian Center near Niamey, Niger, and the SADCC/ICRISAT sorghum and millets improvement program at Matopos, near Bulawayo, Zimbabwe, set up in response to an invitation from the nine-nation Southern African Development Coordination Conference (SADCC).

Since its foundation ICRISAT has realized the importance of communicating its research findings and production technology via a wide range of publications.

Ordering Instructions

In this catalog ICRISAT publications are listed by series and each series is described. For francophone and Spanish-speaking readers, citations of publications printed in French and Spanish are given in those languages. Indication is also given where publications include abstracts or papers printed in additional languages.

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Purchasers in North America should note that most books, research bulletins, information bulletins, and workshop proceedings are available from Agribookstore, Winrock International, 1611 North Kent Street, Arlington VA 22209, USA (phone 703-525-9455). Contact Agribookstore for prices and availability. (But note that prices are higher than if ordered direct from ICRISAT).

Books

K.O. Rachie

The millets: importance, utilization and outlook

(BOE 001). 1975. 72 pages. (Microfiche only). HDC \$3.10, LDC \$3.10.

ICRISAT (International Crops Research Institute for the Semi-Arid Tropics)

Drought research priorities for the dryland tropics

(BOE 010) 1988. 228 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-140-2. HDC \$34.20, LDC \$11.40.

This book is a product of a consultants' meeting held in Nov 1986, and has four parts based on discussion sessions: 1. Defining the problem: translating climatic data into moisture availability patterns usable in drought research. 2. Making the best use of available technology: fitting cropping systems, and crop varieties to the environment. 3. Possibilities for modifying crop and soil management practices to maximize production per unit rainfall. 4. Possibilities for modifying crop varieties to increase production per unit rainfall. The emphasis throughout is on the application of existing knowledge or technology in solving the problems related to crop production in the dryland tropics. (Summary in Fr.)

R.K. Bansal

The Agribar operator's manual: field operations

(BOE 01 1). 1989. 60 pages. 21.5 x 28 cm. Saddle stitched. ISBN 92-9066-126-7. HDC \$17.40, LDC \$5.50.

Clear guidance, with photographs and figures, is given on how to assemble the Agribar, hitch bullocks, and cultivate flat land and broadbeds with plows, tines, and a blade harrow, etc. The manual also helps the reader to sow sole crops and intercrops and to apply fertilizer at different spacings.

Research Bulletins

No. 10

M. von Oppen, and K.V. Subba Rao

Tank irrigation in semi-arid tropical India. Economic evaluation and alternatives for improvement

(RBE 010). 1987. 38 pages. 21 x 27.5 cm. Saddle stitched. ISBN 92-9066-121-6. HDC \$5.70, LDC \$1.90.

Presents the findings of survey of 32 tanks and related farm data from the Andhra Pradesh and Maharashtra states, reviews the history and development of tank irrigation, and discusses the economics of existing tank irrigation. Deterioration of tank irrigation and the need for remedial action are stressed, and alternatives for improving tank irrigation are suggested. (Summary in Fr.)

No. 11

Y.S. Chauhan, Y.L. Nene, C. Johansen, M.P. Haware, N.P. Saxena, Sardar Singh, S.B. Sharma, K.L. Sahrawat, J.R. Burford, O.P. Rupela, J.V.D.K. Kumar Rao, and S. Sithanatham

Effects of soil solarization on pigeonpea and chickpea

(RBE 011). 1988. 20 pages. 21 x 27.5 cm. Saddle stitched. ISBN 92-9066-167-4. HDC \$3.00, LDC \$1.00.

Reports experience gained with field tests on the effects of soil solarization on pigeonpea and chickpea crops at ICRISAT Center during 1984-87. Different techniques and methods employed in applying solarization, and in assessing its impact, are described. The implications of utilizing solarization for these and other crops are also discussed. (Summary in Fr.)

No. 12

S.M. Virmani, H.L.S. Tandon, and G. Alagarswamy

Modeling the growth and development of sorghum and pearl millet

(RBE 012). 1989. 52 pages. 21 x 27.5 cm. Saddle stitched. ISBN 92-9066-174-7. HDC \$7.20 LDC \$2.40.

System modeling can greatly expedite the search for improved development strategies. Recent advances in crop modeling have made it possible to simulate yields and growth of several crops under varied soil and weather conditions with different management practices. The bulletin describes the framework of CERES (Crop Estimation through Resource and Environment Synthesis) models developed by the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). This publication is a cogent source book on the current status of development of CERES and RESCAP models, their data needs, outputs, and applications. (Summary in Fr.)

Information Bulletins

No. 23

M.V.K. Sivakumar, and F. Gnoumou

Agroclimatology of West Africa: Burkina Faso

(IBE 023). 1987. 200 pages. Microfiche only. ISBN 92-9066-122-4.
HDC\$9.30 LDC\$9.30.

No. 24

R.P. Thakur, and S.B. King

Ergot disease of pearl millet

(IBE 024). 1988. 24 pages. 18.5 x 24 cm. Saddle stitched. ISBN
92-9066-137-2. HDC\$7.20, LDC\$2.40.

Ergot, caused by *Claviceps fusiformis*, is a serious and widespread fungal disease that affects grain yield directly. This bulletin details and illustrates geographical distribution, disease symptoms, morphology of the causal fungus and the disease cycle. A brief review of various control measures is also presented. (Summary in Fr.)

No. 25

R.P. Thakur, and S.B. King

Smut disease of pearl millet

(IBE 025). 1988. 20 pages. 18.5 x 24 cm. Saddle stitched. ISBN
92-9066-1384. HDC\$6.00, LDC\$2.00.

Smut, caused by *Tolyposporium penicillariae*, is a serious and widespread disease that can cause up to 30% loss of yield by replacing grain with smut sori. This bulletin concerns geographical distribution, disease symptoms, disease cycle, morphology of the causal fungus, and disease management methods. Various control methods are presented, with emphasis on host plant resistance. (Summary in Fr.)

No. 26

W. Reed, S.S. Lateef, S. Sithanatham, and C.S. Pawar

Pigeonpea and chickpea Insect identification handbook

(IBE 026). 1989. 120 pages. 10 x 18 cm. Paperback. ISBN 92-9066-171-2. HDC \$26.70, LDC \$8.90.

This illustrated bulletin deals with insect pests that attack pigeonpea and chickpea, two major pulse crops in the semi-arid tropics. Information is given on the description, biology, and distributed of these insects, together with the symptoms of damage they cause, and methods of control. Descriptions of several beneficial insects parasites, predators, and pollinators, are included, since it is important to first determine the role of insects found on crops rather than to assume that all insects are harmful and need to be eliminated.

No. 27

N.K. Awadhwal, and G.D. Smith

New implements for crop production in the semi-arid tropics

(IBE 027). 1989. 16 pages. 13.5 x 21 cm. Saddle stitched. ISBN 92-9066-176-3. HDC \$2.40, LDC \$1.00.

A suite of simple bullock-drawn implements has been developed at ICRISAT to form broadbeds and furrows and to carry out subsequent field operations easily. Agribar II, an improved version of the Agribar fitted with a four-row planter, can sow various crops and perform tillage operations. Simple implements based on a T-bar have been developed for making broadbeds, applying fertilizer, sowing, and interrow cultivation. A crust breaker was developed to enhance seedling emergence through the surface crust. A spinning-disc knapsack sprayer and a groundnut digger have also been developed to meet specific requirements of farmers who grow groundnut in the semi-arid tropics. (Summary in Fr.)

No. 29

S.N. Nigam, M.J. Vasudeva Rao, and R.W. Gibbons

Artificial hybridization in groundnut

(IBE 029). 1990. 28 pages. 18.5 x 24 cm. Saddle stitched. ISBN 92-9066-177-1. HDC \$4.20, LDC \$1.20.

This colorfully illustrated publication describes the procedures of artificial hybridization in groundnut followed at ICRISAT Center. It also presents suggestions on how to organize a successful hybridization program in groundnut. With clear step-by-step illustration, this bulletin is meant to be used as a practical guide to plan and carry out artificial hybridization in groundnut, both in the field and in the greenhouse. (Summary in Fr.)

Conference/Workshop Proceedings

Proceedings of the international Sorghum Entomology Workshop, 15- 21 Jul 1984

(CPE 031). 1985.434 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-108-9. HDC \$33.00, LDC \$11.00.

Participants discussed the need for sorghum entomology research the world over, with special reference to the developing world. Reports are given on sorghum pests in eastern and West Africa, Southeast Asia, India, Australia, and most of the Americas. Other sections concern specific pests and a final section is developed for insect resistance in sorghum and other control approaches. (Summary in Fr.)

Groundnut rust disease: proceedings of a Discussion Group Meeting, 24-28 Sep 1984

(CPE 032). 1987.210 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-109-7. HDC \$31.80, LDC \$10.60.

The spread of groundnut rust (*Puccinia arachidis*) in the past 2 decades has taken place despite quarantine precautions and care in the exchange of germplasm. This publication highlights research on this little-known disease and includes regional and country reports on its occurrence. Distribution and spread of the groundnut rust pathogen, its taxonomy, the possible occurrence of races, the physiology of rust disease, and breeding for resistance are also discussed. (Summary in Fr.)

Collaborative research on groundnut rosette virus: summary proceedings of the Consultative Group Meeting to Discuss Collaborative Research on Groundnut Rosette Virus Disease, 13-14 Apr 1985

(CPE 033). 1985.28 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-113-5. HDC \$3.80, LDC \$1.30.

Contains the summaries of eight papers presented at the meeting, which brought together representatives of various research groups working on groundnut rosette virus disease from all over the world to discuss recent findings and plans for future research. Recommendations for a coordinated international collaborative plan and the guidelines set down for each research group are also included.

Training needs for dryland agriculture with particular reference to deep Vertisol technology: proceedings of the Workshop, 17-18 Jul 1985

(CPE 034). 1985. 48 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-114-3. HDC\$3.80, LDC\$1.30.

The recommendations made include suggestions for effective watershed management and development, stronger infrastructural facilities and staff for training, and measures for strengthen research resources.

Farming systems principles for improved food production and the control of soil degradation in the arid, semi-arid, and humid tropics: summary proceedings of an Expert's Meeting, 20-23 Jun 1983

(CPE 035). 1986. 44 pp. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-115-1. HDC\$3.80, LDC\$1.30.

Comprises the summary proceedings of an experts' meeting by the UN Environment Programme, the main objectives of which were to identify areas of farming systems research and development having potential to significantly increase food production and promote soil conservation for selected agroecological zones. Guidelines and research priorities are given for farming systems to prevent soil degradation in arid lands, the semi-arid tropics, and the humid tropics. These are supported by case studies from Egypt, India, Nigeria, the Philippines, and Thailand.

Agroforestry research in the semi-arid tropics: a report on the Working Group Meeting, 5-6 Aug 1985

(CEP 036). 1986. 68 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-115-X. HDC\$5.30, LDC\$1.80.

This meeting brought together participants from industrial, research, university, donor, and international organizations, to share ideas,

methodologies, and results on agroforestry research, Recommendations were made for both bioscientific and socioeconomic research, and for developing collaborative linkages.

Cereal nitrogen fixation: proceedings of the Working Group Meeting, 9-12 Oct 1984

(CPE 037). 1986. 128 pages. Microfiche only. ISBN 92-9066-111-0. HDC\$5.00, LDC\$5.00.

Agrometeorology of groundnut: proceedings of an international Symposium, 21-26 Aug 1985

(CPE 038). 1986. 292 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-112-7. HDC\$22.20, LDC\$7.40.

This symposium provided a forum for the exchange of information about the agrometeorology of groundnut in the semi-arid tropics, and participants reviewed the present knowledge of agrometeorological factors that primarily influence the growth and development of groundnut and identified research gaps. They also evaluated techniques that describe the weather risks to groundnut production and quantify the response of the plant to its environment, and discussed the use of operational agrometeorological information in efforts to improve groundnut yield. The proceedings include a summary of the findings of each session, and the recommendations made. (Summary in Fr.)

Research on grain legumes in eastern and central Africa: summary proceedings of the Consultative Group Meeting for Eastern and Central African Regional Research on Grain Legumes (Groundnut, Chickpea, and Pigeonpea), 8-10 Dec 1986

(CPE 042). 1987. 128 pp. 17 x 23.5 cm. Paperback. ISBN 92-9066-129-1. HDC\$19.20, LDC\$6.40.

Extended summaries of 18 papers describe ICRISAT's research of three legume crops, report on ongoing research from individual countries, and discuss funding and networking that can strengthen regional research. Also included are keynote addresses and recommendations. The countries represented were Burundi, Ethiopia, Kenya, Rwanda, Sudan, and Uganda.

Adaptation of chickpea and pigeonpea to abiotic stresses: proceedings of the Consultants' Workshop, 19-21 Dec 1984

(CPE 043). 1987. 184 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-130-5. HDC\$27.50, LDC\$9.20.

Discusses in the 14 papers: climatic and drought stresses, soil toxicities, nitrogen fixation, and regional problems. Also included are introductory papers that present an overview of farmers' problems and the research needed to find solutions, and participants' recommendations.

Proceedings of the international Pearl Millet Workshop, 7-11 Apr 1986

(CPE 044). 1987. 366 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-134-8. HDC\$54.80, LDC\$18.30.

Discusses improvements through plant breeding, biological factors that effect the crop, climatic and edaphic limitations to crop yields, androgenesis and enzymatic diversity in the crop, food quality, quantitative genetics, entomology, microbiology, and pathology of the crop, the crop's role in fodder and forage production, its production in dry areas, and its performance in intensive agriculture. The research priorities drawn up for different geographical regions are included. (Summary in Fr.)

Summary and recommendations of the International Workshop on Aflatoxin Contamination of Groundnut, 6-9 Oct 1987

(CPE 045). 1988.44 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-146-1. HDC\$6.60, LDC\$2.20.

Aims to increase awareness of this serious problem that affects groundnut production worldwide. The booklet contains an overview of aflatoxin contamination of groundnut that is caused by infection of the crop by toxigenic strains of the fungus *Aspergillus flavus*. Also included are summaries of the workshop, papers, group discussion reports, and recommendations.

Rapport sommaire et recommandations du colloque international sur la contamination des arachides par les aflatoxines, 6-9 Oct 1987

(CPF 045). 1988. 52 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-162-3. HDC \$6.60, LDC \$2.20.

Cette publication a pour but d'augmenter la sensibilisation à la contamination des arachides par les aflatoxines, un grave problème qui affecte la production arachidière mondiale. Elle donne une vue d'ensemble sur cette maladie qui est provoquée par le champignon toxigène, *Aspergillus flavus*. Les résumés des communications présentées à l'occasion du colloque, ainsi que les procès verbaux des discussions et les recommandations sont également présentés.

Resumen y Recomendaciones del Taller Internacional sobre Contaminación por Aflatoxinas en Cacahuete, 6-9 Oct 1987

(CPS 045). 1988. 52 páginas. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-163-1. HDC \$6.60, LDC \$2.20.

Pretende incentivar la concientización de este serio problema, el cual afecta la producción del cacahuete en todo el mundo. La publicación contiene una revisión general de la contaminación por aflatoxinas en cacahuete causada por la infección del cultivo por toxinas producidas por cepas del hongo *Aspergillus flavus*. Se incluyen, también, resúmenes de los trabajos presentados en el taller, informes de las mesas de trabajo, y recomendaciones.

Biotechnology in tropical crop improvement: proceedings of the international Biotechnology Workshop, 12-15 Jan 1987

(CPE 046). 1988. 160 pp. 17 x 23.5 cm. Pauerback. ISBN 92-9066-135-6. HDC \$24.00, LDC \$8.00.

The 19 papers presented in this publication aim to provide readers with an understanding of the variety of the techniques in biotechnology being employed in agricultural research, their relevance and usefulness, and their possible future benefits. The book is divided into two major parts that concern (1) research in genetic manipulation techniques, and (2) research that deals with crop products and their uses.

Uses of sorghum and millets: summary proceedings of an International Workshop on Policy, Practice, and Potential Relating to Uses of Sorghum and Millets, 8-12 Feb 1988

(CPE 047). 1988. 36 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-1593. HDC \$5.40, LDC \$1.80.

Comprises keynote speeches, recommendations, and abstracts of 26 papers. The papers outline research and development efforts aimed at the better utilization of sorghum and millets.

Coordinated research on groundnut rosette virus disease: summary proceedings of the Consultative Group Meeting, 8-10 Mar 1987

(CPE 048). 1988. 36 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-142-9. HDC \$5.40, LDC \$1.80.

Presents summaries of 13 papers dealing with wide-ranging aspects of the disease and its control, with special reference to the semi-arid tropics, and ends with seven recommendations.

Summary and recommendations of the Asian Region Groundnut Scientists' Meeting, 14- 17 Nov 1988

(CPE 049). 1988. 24 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-172-0. HDC \$3.60, LDC \$1.20.

Reports problems of groundnut production in the region and ways to overcome constraints to production through collaborative projects. Reviews international research organizations' inputs on such topics as diseases, pests, photoperiod and temperature, drought, nutrient stresses, post harvest technology and aflatoxin, germplasm collection and adaptation, crop production, international cooperation and training, groundnut research in Indonesia. Agreed priorities for research are stated and recommendations are given for research collaboration and increased training for scientists,

Coordination of research on peanut stripe virus: summary proceedings of the First Meeting to Coordinate Research on Peanut Stripe Virus Disease of Groundnut, 9-12 Jun 1987

(CPE 050). 1988. 30 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-143-7. HDC\$4.80, LDC\$1.60.

Peanut stripe virus disease of groundnut causes crop losses of economic significance. Its rapid spread across groundnut-producing regions of the world gives cause for concern. As the virus is seed-transmitted it is of considerable importance in plant quarantine. This publication comprises six country papers, two specialist papers, and eight discussion papers, followed by recommendations for strategies to contain the spread of the disease.

Phosphorus in Indian Vertisols: summary proceedings of a Workshop, 23-26 Aug 1988

(CPE 051). 1988. 40 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-168-2. HDC\$6.00, LDC\$2.00.

Summaries of 16 papers concerning soil chemistry, soil tests and crop responses, non-legume agronomy, and legume agronomy. They are followed by summaries of discussions, recommendations of the meeting, and a proposal for collaborative work.

Collaboration on Genetic Resources: summary proceedings of a Joint ICRISAT/NBPGR(iCAR) Workshop on Germplasm Exploration and Evaluation in India, 14-15 Nov 1988

(CPE 052). 1989. 124 pp. 17 x 23.5 cm. Paperback. ISBN 92-9066-170-4. HDC\$18.60, LDC\$6.20.

This publication is the summary proceedings of the workshop on germplasm exploration and evaluation in India, held 14-15 Nov 1988, at ICRISAT Center, cosponsored by ICRISAT and the National Bureau of Plant Genetic Resources (NBPGR) of the Indian Council of Agricultural Research (CAR). Included are summaries of 19 papers presented on world germplasm collections; exploration, collection, evaluation, documentation, exchange, quarantine, and conservation of germplasm; and use and impact of germplasm in crop improvement in India. Highlights of the discussions and the recommendations of the workshop also form part of this publication.

Report of the CGIAR Documentation and information Services Meeting, 16-20 Jan 1989

(CPE 053). 1989. 40 pp. 17 x 23.5 cm. Saddle stitched. HDC \$6.00, LDC\$2.00.

Presents recommendations for future action by CGIAR Centers and national agricultural research systems (NARSs) on information networking and human resource development, and on the ways in which both NARSs and CGIAR information activities can be strengthened. Two annexes present case studies on information needs in NARSs and a proposal for information networking in Africa.

International Workshop on Sorghum Stem Borers, 17-20 Nov 1987

(CPE 054). 1989. 192 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-145-3. HDC\$28.80, LDC\$9.60.

Over 35 agricultural scientists from 12 nations gathered at ICRISAT Center from 17 to 20 Nov 1987 to confer with ICRISAT scientists on insect pest management strategies relating to stem borers of sorghum, a cereal grown over 50 million ha of the world. Included are inaugural addresses, followed by papers presented at the Workshop on current regional research in Africa, Asia, Central and South America: host-plant resistance, bionomics, and control of the pest other than by host-plant resistance, and breeding for resistance, and recommendations and discussions. (Summary in Fr.)

Small watershed hydrology: summary proceedings of a workshop on The Role of Small Watershed Hydrology in Rainfed Agriculture, 22- 24 Nov 1988

(CPE 055). 1989. 44 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-106-2. HDC\$6.60, LDC\$2.20.

Thirty-four participants from research institutions in India and one from Thailand joined ICRISAT scientists at the workshop. Presented in this volume are the welcome address, abstracts of the papers, and the recommendations, which cover instrumentation, structures, data bases, data analysis and transfer, modeling, soil and water conservation, vegetation, plant production and water use, local cooperation, and information networks.

Linking grain legumes research in Asia: summary proceedings of the Regional Legumes Network Coordinators' Meeting, 15-17 Dec 1988

(CPE 056). 1989. 112 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-173-9. HDC\$16.80, LDC\$5.50.

The role of the Asian Grain Legumes Network (AGLN) coordinated by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is examined. Different kinds of agricultural research networks are discussed. The relative importance of groundnut, pigeonpea, and chickpea in the AGLN member countries is presented, together with the status of current research, future research priorities, and suggestions for strengthening collaboration. The contribution of ICRISAT is outlined. The links between AGLN and other entities involved in Asian crop research are presented. Ways of strengthening these links, and the future development of AGLN, are discussed.

Proceedings of the Third Regional Groundnut Workshop for Southern Africa, 13-18 Mar 1988

(CPE 057). 1989. 240 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-161-5. HDC\$36.00, LDC\$12.00.

Twenty-four of 26 national program scientists actively engaged in groundnut improvement in the Southern African Development Coordination Conference (SADCC) region participated in the Regional Workshop; Angola being the only country in the region not represented. Also participating were groundnut scientists from Zaire and Mauritius and scientists from ICRISAT Center (India), SADCC/ICRISAT Regional Groundnut Improvement Program (Malawi), and the ICRISAT Sahelian Center (Niger). Papers reviewed groundnut research on breeding, entomology, and agronomy; early leaf spot disease of groundnut; and new methods for detection of aflatoxin contamination. The recommendations arising from the meeting afford a valuable guideline for regional project activities. (Summary in Fr.)

Aflatoxin contamination of groundnut: proceedings of the International Workshop, 6-9 Oct 1987

(CPE 058). 1989. 432 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-144-5. HDC\$64.80, LDC\$21.60.

Contains a general overview of the problem of aflatoxin contamination of groundnut and over 40 papers grouped to cover the following topics: importance of aflatoxins, aflatoxins and trade, monitoring and

action at national level, removal of aflatoxins, methods for aflatoxins analysis, general research on aflatoxin contamination, and genetic resistance. Also included are group discussion reports on; evaluation and monitoring of contamination of groundnuts and groundnut products, analytical methods, research on on-farm control of aflatoxin contamination, and research on control with reference to storage, transit, processing, etc. Recommendations cover information and training, strategies for control, and future research needs. Overview, summaries, group discussion reports, and recommendations, in English, French, and Spanish.

Summary proceedings of the Second Coordinators' Meeting on Peanut Stripe Virus, 14 Aug 1989

(CPE 059). 1989. 32 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-150-X. HDC\$4.80, LDC\$1.60.

Peanut stripe virus disease of groundnut has spread rapidly in many groundnut-producing countries, and causes economically significant crop losses. Groundnuts are an important oilseeds crop in many regions of the developing world, as well as a major protein source. Plant quarantine strategies are a critical factor in containing this seed-transmitted virus because plant breeders frequently exchange germplasm, often between countries. In this publication, scientists review research and the country-specific situation of peanut stripe disease in China, India, Indonesia, Japan, the Philippines, Thailand, and USA. In addition, the Peanut Collaborative Research Support Program (Peanut CRSP), USA, and a microcomputer data base on the virus are described. Six technical papers cover seedborne legume viruses, comparison of peanut stripe virus isolates, purification and serological relationships of peanut stripe virus, the molecular basis for potyvirus serology, and use of high-performance liquid chromatographic peptide profiling of coat protein digests. Recommendations are made for further action to control the spread of this disease, to estimate crop losses, and to formulate management strategies.

Soil, Crop, and Water Management Systems for Rainfed Agriculture in the Sudano-Sahelian Zone: proceedings of an International Workshop, 11-16 Jan 1987

(CPE 060). 1989. 400 pages. 17 x 23.5 cm. Paperback. ISBN 92-9066-1694. HDC \$60.00, LDC \$20.00.

This workshop aimed to: (1) assess and discuss major problem and constraints to increasing the productivity and stability of soil, crop, and Water management systems in the sub-Saharan Region and

particularly, the Sudano-Sahelian zone; (2) review available data bases and current research activities, and to develop strategies to resolve major problem through research and agrotechnology transfer; (3) consider the development of an effective and comprehensive research and training network which includes scientist-to-scientist linkages between national/regional scientists, and with scientists in developed countries working on similar problems of dryland or rainfed agriculture. This publication covers the five sessions which discuss the following topics: overview of rainfed agriculture in the Sudano-Sahelian zone; soil/water management for conservation/production systems in low-rainfall areas: crop/livestock relationships, residue management, and agrogorestry; cropping systems and cultural practices; and systems modeling and economic considerations. Thirty-two papers are presented, of which seven are in French. (Summary in Fr.)

Management of Vertisois for improved agricultural production: proceedings of an IBSRAM Inaugural Workshop, 18-22 Feb 1985

(CPE 061). 1989. 284 pages. 17 x 23.5 cm. Saddle stitched. ISBN 92-9066-139-9. HDC \$42.60, LDC \$14.20.

This volume includes 23 papers presented at the workshop, the welcome address, summaries of discussions, and the recommendations. Covered are such themes as approaches to management of Vertisols in different agroclimatic zones, research needs and constraints, technologies available and their components, methods of technology transfer, and the concept of a Vertisols network.

Germplasm Catalogs

P. Remanandan, D.V.S.S.R. Sastry, and Melak H. Mengesha

ICRISAT pigeonpea germplasm catalog (in two companion volumes): Evaluation and analysis

23.5 x 17 cm. Paperback. ISBN 92-9066-152-6.

Passport Information

23.5 x 17 cm. Paperback. ISBN 92-9066-153-4. (GCE 001). 1988. 100 and 524 pages. HDC \$73.20, LDC \$24.40.

Presents the results of multidisciplinary efforts in the collection, evaluation, characterization, screening, and classification of the 11 034 pigeonpea germplasm accessions from 50 countries, held in the

ICRISAT gene bank and freely available to pigeonpea scientists throughout the world from ICRISAT Center. The volumes contain classified and concise information on the present state of pigeonpea genetic resources, intended to promote and accelerate pigeonpea germplasm enhancement and utilization.

R.P.S. Pundir, KN. Reddy, and Melak H. Mengesha

ICRISAT chickpea germplasm catalog (in two companion volumes): Evaluation and analysis

23.5 x 17 cm. Paperback. ISBN 92-9066-154-2.

Passport information

23.5 x 17 cm. Paperback. ISBN 92-9066-155-0.
(GCE 002). 1988. 100 and 524 pp. HDC \$94.00, LDC \$31.40.

Presents the results of multidisciplinary efforts in collection, evaluation, characterization, screening and classification of the 15 000 chickpea germplasm accessions from 41 countries that are held in ICRISAT gene bank and are freely available to chickpea scientists throughout the world. The volumes contain classified and concise information on the status of chickpea genetic resources intended to promote, accelerate, and enhance chickpea germplasm utilization.

General Audience

Historic relics at ICRISAT Center

(GAE 005). 1981. 12 pages. 14 x 12 cm. Saddle stitched.

A liberally illustrated brochure describing archeological excavations and findings on the ICRISAT site at Patancheru, Andhra Pradesh, during the development of the Institute's buildings and research farm. Distributed internally to visitors.

ICRISAT Publications Catalog

(GAE 009). 1990. 50 pages. 18.5 x 24 cm. Saddle stitched.

Lists current, and microfiched out-of-print, multilingual publications from the Institute, supplemented with brief descriptions of their contents. Single copies free, issued annually.

Catalogues de publications de l'ICRISAT

(GAF 009). 1990.50 pages. 18.5 x 24 cm. Saddle stitched.

Ce catalogue répertorie des publications multilingues courantes et épuisée (disponibles en microfiches), de l'ICRISAT, supportées par brèves descriptions. Exemplaires simples gratuits, paraissent chaque année.

Catálogos de publicaciones del ICRISAT

(GAS 009). 1990. 50 páginas. 18.5 x 24 cm. Saddle stitched.

Lista publicaciones corrientes y aquellas fuera de edición, en microfichas, y multilinguas del Instituto, suplementadas con breves descripciones de sus contenidos. Copias individuales, gratuitas, emitidas anualmente.

Plant quarantine at ICRISAT

(GAE 01 1). 1984.2 pages. 10 x 23 cm. Leaflet.

The leaflet details the import and export requirements for ICRISAT seeds and explains the procedures for ordering and dispatch.

La quarantaine a l'ICRISAT

(GAF 011). 1988.6 pages. 10 x 23 cm. Leaflet.

Ce dépliant précise les conditions requises pour l'importation et l'exportation des semences de l'ICRISAT.

Cuarentena vegetal en el ICRISAT

(GAS 01 1). 1988.6 pp. 10 x 23 cm. Leaflet.

Este folleto contiene detalles sobre los requerimientos de exportación de semillas de ICRISAT y explica los procedimientos de peddo y despacho.

ICRISAT In Africa

(GAE 012). 1986.60 pages. 17 x 23.5 cm. Saddle stitched.

Describes the collaborative work ICRISAT scientists in semi-arid tropical countries in Africa. Illustrated in color.

L'ICRISAT en Afrique

(GAF 012). 1986. 60 pages. 17 x 23.5 cm. Saddle stitched.

Décrit les travaux collaboratifs des chercheurs de l'ICRISAT dans les pays tropicaux semi-arides en Afrique. Illustré en couleurs.

Small agricultural watersheds at ICRISAT

(GAE 013). 1986. 2 pages. 9.5 x 21 cm. Leaflet.

A leaflet describing the methods and benefits of watershed development on black soils.

About ICRISAT

(GAE 015). 1988. 8 pages. 10 x 18 cm. Saddle stitched.

A concise leaflet presenting basic facts on ICRISAT's constitution, area of work, and training programs, mandate crops, client groups, and donors.

L'ICRISAT

(GAF 015). 1988. 8 pages. 10 x 18 cm. Saddle stitched.

Un dépliant décrivant brièvement la constitution de l'ICRISAT, son domaine de travail et ses programmes de formation, les cultures de son mandat, les groupes clients ainsi que les donateurs.

Looking ahead: a 10-year plan

(GAE 016). 1987. 86 pp. 18.5 x 24 cm. Saddle stitched.

Describes the goals and priorities of the Institute for the next 10 years, in terms of target groups, research strategies, the transfer of information and technology, organization and cooperation, and resources.

Vegetable pigeonpea: a promising crop for India

(GAE 017). 1987. 16 pages. 14 x 22 cm. Saddle stitched.

This color-illustrated leaflet is intended to widen the scope of pigeonpea cultivation and use in India. It describes the available vegetable-type cultivars and describes ways of growing and using the crop as a nutritious vegetable.

ICRISAT in print: a cumulative record of publications 1975-86

(GAE 018). 1987. 137 pages. 18.5 x 24 cm. Paperback.

A record of 1450 entries, published on the Institute's 15th anniversary, that includes journal articles, conference papers, Institute-level publications, and theses resulting from work done at ICRISAT, categorized by crop and indexed by authors. Supplements for 1987, 1988, and 1989 are available.

ICRISAT in West Africa

(GAE 019). 1987. 12 pages. 14 x 22 cm. Saddle stitched.

A brief description of the Institute's research programs and collaborative activities in the Sahelian Center at Sadore and elsewhere in West Africa.

L'ICRISAT en Afrique occidentale

(GAF 019). 1987. 12 pages. 14 x 22 cm. Saddle stitched.

Decrit brievement les activites de recherche collaboratives de l'Institut conduites au Centre Sahelien a Sadore, au Niger et ailleurs en Afrique occidentale.

Semi-Arid Tropical information Service (SATCRIS)

(GAE 020). 1988. 12 pages. 14 x 22 cm. Saddle stitched.

An outline of the documentation and delivery services available to SATCRIS clients.

Centre d'information sur les cultures des zones tropicales semi-arides (SATCRIS)

(GAF 020). 1988.12 pages. 14 x 22 cm. Saddle stitched.

Un apertu des services de documentation et de diffusion mis a la disposition des utilisateurs du SATCRIS.

Introduction to Hyderabad and Surroundings

(GAE 022). 1989.20 pages. 14 x 22 cm. Saddle stitched.

A short guide used for ICRISAT visitors and workshop delegates.

Hyderabad - Secunderabad: A guide and directory

(GAE 023). 1985.96 pages. 18.5 x 24 cm. Saddle stitched.

Information on living in the twin cities, sightseeing, history and culture, activities, and ashopping guide are included. Intended primarily for newcomers to the ICRISAT community, the publication is on sale for Rs 25.00 in the Mamta shop at ICRISAT Center and proceeds go to help the work of the ICRISAT Ladies Association for the Welfare of Women and Children (ILAWAC).

Plant Material Descriptions

No. 15

Sorghum hybrid ICSH 153

(PME 015). 1988.4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-156-9.

No. 16

Sorghum variety ICSV 112

(PME 016). 1988.4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-157-7.

No. 17

Sorghum variety ICSV 145

(PME 017). 1988.4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-158-5.

No. 18

Pearl Millet Open-pollinated Variety ICTP 8203

(PME 018). 1989.4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-147-x.

No. 19

Pearl Millet Hybrid ICMH 423

(PME 019). 1989. 4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-148-8.

No. 20

Groundnut Variety ICGS 11 (ICGV 87123)

(PME 020). 1989. 4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-151-8.

No. 21

Groundnut Variety ICGV 87128 (ICGS 44)

(PME 021). 1989. 4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-107-0.

No. 22

Chickpea kabull variety ICCV 2

(PME 022). 1990. 4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-184-4.

No. 23

Chickpea kabull variety ICCV 5

(PME 023). 1990. 4 pages. 14 x 21.5 cm. Leaflet. ISBN 92-9066-185-2.

Bibliographies

Millets bibliography 1982

(BBE 014). 1985. 366 pages. 22 x 28 cm. Paperback. ISBN 92-9066-110-0.

Sorghum bibliography 1982

(BBE 015). 1986. 392 pages. 22 x 28 cm. Paperback. ISBN 92-9066-117-8.

Newsletters

International Arachis Newsletter

(NGE) Semiannual. 21 x 27 cm. Saddle stitched. ISSN 010-5824.

Reports a range of research and development work concerning groundnut (*Arachis hypogaea*) and related *Arachis* species. Also included are news items, such as notices of and reports on conferences, reports of special interest (e.g., disease surveys and new machinery), and book reviews.

Audiovisual Materials

Regard sur l'ICRISAT

(SSF 001). 1989. ISBN 92-9066-064-3. HDC \$36.00, LDC \$36.00,

Diaporama sur les recherches effectuées par l'ICRISAT et son rôle dans le système du groupe consultatif pour la recherche agricole internationale (CGIAR). 74 diapositifs en couleur avec commentaire. 20 minutes.

IFPRI

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General Information

Research at IFPRI is aimed at contributing to the reduction of hunger and malnutrition in low-income countries through the analysis of underlying processes that extend beyond the narrowly defined food sector. The results of IFPRI's research and analysis are intended to assist policymakers in developing countries make informed decisions on food policy issues. IFPRI works closely with other international and developing-nation institutions to understand food production, consumption, trade, and growth processes; to develop new options for policymakers; and to assess the efficacy of existing policies.

Individual copies of most IFPRI publications are free but multiple copies will carry a fee plus shipping costs. The fee varies with size and weight of publications.

Annual Report

IFPRI Report 1989

April 1989. 100 pages. 17.8 x 25.4 cm. Perfect.

The annual report summarizes the year's work in each of the Institute's five main programs—food data evaluation, food production policy, agricultural growth linkages, food consumption and nutrition policy, and international trade and food security—as well as the year's seminars and collaborative work. Previous issues of IFPRI Report are also available.

Monographs

Research Reports

Number of pages varies. 17.8 x 25.4 cm. Perfect and saddle stitched.

The main vehicle for reporting IFPRI research results is its Research Report series. The reports, which range from 30 to 180 pages, present data, analysis, and findings of completed research projects. Reports are reviewed by experts from outside the Institute. Since 1976 IFPRI has published 80 research reports.

These are free, except for multiple copies and to booksellers, when they cost \$3.00 for publications with 48 or fewer pages, and \$4.00 for publications with 49 or more pages. Surface mail is free; air postage costs \$3.00.

No. 62

Ram P. Yadav

Agricultural Research in Nepal: Resource Allocation, Structure, and Incentives

September 1987. 77 pages. ISBN 0-89629-064-6.

Against the background of declining agricultural productivity in Nepal, this study traces the evolution of the country's agricultural research system and makes detailed recommendations for strengthening it.

No. 63

Eileen T. Kennedy and Bruce Cogill

Income and Nutritional Effects of the Commercialization of Agriculture in Southwestern Kenya

November 1987. 60 pages. ISBN 0-89629-065-4.

This study evaluates the effects of a shift from maize to sugarcane production on agricultural production, income, expenditure patterns, food consumption, and the health and nutritional status of preschool-aged children and their mothers in South Nyanza, Kenya.

No. 64

Harold Alderman

Cooperative Dairy Development in Karnataka, India: An Assessment

December 1987. 60 pages. ISBN 089629-066-2.

Using data from a five-round household survey of 62 villages, this report assesses the Karnataka Dairy Development Project, a World Bank program initiated in 1974 that is modeled after the controversial Operation Flood projects.

No. 65

Mahabub Hossain

Credit for Alleviation of Rural Poverty: The Grameen Bank in Bangladesh

February 1988. 89 pages. ISBN 0-89629-067-0.

This report examines the highly innovative and successful institution, the Grameen Bank, in Bangladesh. The Bank was established in 1983 for the exclusive purpose of providing credit without collateral to the rural poor to enable them to generate self-employment. Loan repayment performance is excellent, which is unusual for rural development credit programs in low-income countries.

No. 66

Geraldo M. Calegar and G. Edward Schuh

The Brazilian Wheat Policy: Its Costs, Benefits, and Effects on Food Consumption

May 1988. 63 pages. ISBN 0-89629-068-9.

This report identifies and measures the effects of extensive government interventions in Brazil's wheat sector on welfare, income distribution, and trade. It addresses the question of whether the separate wheat policies that subsidize both producers and consumers have negatively affected the economy and created a drain on the public budget.

No. 67

Mahabub Hossain

Nature and Impact of the Green Revolution In Bangladesh

July 1988. 146 pages. ISBN 0-89629-070-0.

This study, using two large household surveys conducted between 1979 and 1982, examines the characteristics of modern seed-fertilizer-water agricultural technology as applied particularly to rice production in Bangladesh, and investigates the effects of that technology on agricultural productivity and rural income distribution.

No. 68

Jorge Garcia Garcia and Gabriel Montes Llamas

Coffee Boom, Government Expenditure, and Agricultural Prices: The Colombian Experience

August 1988. 107 pages. ISBN 0-89629-069-7.

In this report Garcia and Montes trace Colombia's economic decline in the 1980s to two developments in the 1970s -- the coffee boom,

which drew resources to the coffee sector and discouraged other sectors, and the growth of government spending, which resulted in a fiscal deficit and a reduction in international reserves. The consequent impact on agriculture is examined.

No. 69

Shubh Kumar and David Hotchkiss

Consequences of Deforestation for Women's Time Allocation, Agricultural Production, and Nutrition in Hill Areas of Nepal

October 1988.72 pages. ISBN 0-89629-071-9.

This report examines the effects of deforestation in Nepal on time allocation (particularly of women), agricultural output, food consumption, and nutrition, using cost in time spent collecting fuel as the measure.

No. 70

Joachim Zietz and Alberto Valdés

Agriculture In the GATT: An Analysis of Alternative Approaches to Reform

November 1988. 119 pages. ISBN 0-89629-072-7.

Zietz and Valdés provide an overview of agriculture in the framework of the General Agreement on Tariffs and Trade, establish criteria for judging alternative trade reforms, and, after using these criteria to analyze various reform elements, suggest a comprehensive trade reform proposal for agriculture that may also be useful for other trade sectors.

No. 71

Thomas C. Pinckney

Storage, Trade, and Price Policy Under Production Instability: Maize In Kenya

December 1988.102 pages. ISBN 0-89629-073-5.

This report addresses the problem of minimizing fiscal costs, imports, and price fluctuations for producers and consumers of Kenya's staple food, white maize.

No. 72

Raisuddin Ahmed and Andrew Bernard

Rice Price Fluctuation and an Approach to Price Stabilization in Bangladesh

February 1989.84 pages. ISBN 0-89629-0743.

This report examines the sources and extent of rice price variability in Bangladesh and provides a complete framework for implementing a mechanism for limiting future fluctuation.

No. 73

Joachim von Braun, David Hotchkiss, and Maarten Immink

Nontraditional Export Crops in Guatemala: Effects on Production, income, and Nutrition

May 1989.99 pages. ISBN 0-89629475-1.

This study focuses on a cooperative of small farmers in the Western Highlands of the country. During the last decade the cooperative has had increasing success in growing export vegetables that are not among their traditional crops, while maintaining the production of their traditional subsistence foods. The main relationships studied in this evaluation of increased commercialization are its effects on agricultural production (especially food) and on employment and income (on-farm and off-farm), and how these affect food and nonfood expenditures, food consumption, and nutrition.

No. 74

Tshikala B. Tshibaka

Food Production in a Land-Surplus, Labor-Scarce Economy: The Zairian Basin

June 1989.70 pages. ISBN 0-89629476-X.

This study examines the constraints facing small farmers in Zaire's tropical rainforest.

No. 75

Joachim von Braun, Detlev Puetz, and Patrick Webb

Irrigation Technology and Commercialization of Rice in The Gambia: Effects on income and Nutrition

August 1989. 116 pages. ISBN 0-89629-0778.

The focus of this study is the Jahally-Pacharr Smallholder Rice Project, established in 1983 and the most successful of several irrigation schemes in The Gambia in the last two decades. The study analyzes the links between production, technology, commercialization, income, consumption, and nutrition.

No. 76

Yair Mundlak, Domingo Cavallo, and Roberto Domenech

Agriculture and Economic Growth in Argentina, 1983-84

November 1989. 139 pages. ISBN 0-89629-078-6.

This study analyzes Argentina's sectoral growth over an extended period using a framework that allows the economic environment to affect resource allocation and productivity directly, thus making it possible to evaluate the consequences of macro, trade, and price policies.

No. 77

Thomas C. Pinckney

The Demand for Public Storage of Wheat in Pakistan

December 1989. 110 pages. ISBN 0-89629-079-4.

This study addresses the complexities involved in calculating the government storage capacity required when governments in less-developed countries intervene in domestic markets for staple foods in order to stabilize consumption and prices.

No. 78

Eileen Kennedy

The Effects of Sugarcane Production on Food Security, Health, and Nutrition in Kenya: A Longitudinal Analysis

December 1989. 56 pages. ISBN 0-89629-080-8.

This report offers a longitudinal analysis of the effects of sugarcane production on food security, health, and nutrition in Kenya.

No. 79

Howarth E. Bouis and Lawrence J. Haddad

Effects of Agricultural Commercialization on Land Tenure, Household Resource Allocation, and Nutrition in the Philippines

January 1990. 72 pages. ISBN 0-89629-081-6.

This report addresses the criticism of commercialization of agriculture, particularly export cropping, in developing countries as being a cause of malnutrition. This case study is one of five that IFPRI has undertaken in different countries.

Books

John W. Mellor and Raisuddin Ahmed, eds.

Agricultural Price Policy for Developing Countries

1988. 327 pages. 16.51 x 23.5 cm. Hardcover. ISBN 0-8018-3586-0. US\$35.00. The Johns Hopkins University Press and Oxford University Press for IFPRI.

Distinguished specialists recommend approaches for managing price fluctuations and exchange rates, relating domestic to international prices, and balancing the needs of producers and consumers in a coherent and consistent strategy of economic development.

Per Pinstrup-Andersen, editor

Food Subsidies in Developing Countries

1988. 374 pages. 16.51 x 23.5 cm. Hardcover. ISBN 08018-3632-8. US\$39.00. The Johns Hopkins University Press for IFPRI.

Nineteen leading economists, nutritionists, and policy analysts present key findings by synthesizing practical experiences with subsidy programs in countries throughout Asia, Africa, and Latin America. The authors emphasize lessons applicable to decision making on current and future food policy for developing countries.

Jock R. Anderson and Peter B.R. Hazell, eds.

Variability in Grain Yields

1989.395 pages. 16.51 x 23.5 cm. Hardcover. ISBN 0-80183793-6. US\$45.00. The Johns Hopkins University Press for IFPRI.

A distinguished group of agronomists, plant breeders, economists, geographers, and others analyze the underlying biological, climatic, and economic factors that affect yield variability. They present new evidence on changing patterns of world and national grain production and yield performance of new and old varieties.

David E. Sahn, ed.

Seasonal Variability in Third World Agriculture: The Consequences for Food Security

1989.366 pages. 16.51 x 23.5 cm. Hardcover. ISBN 0-8018-3829-0. US\$44.50. The Johns Hopkins University Press for IFPRI.

In most Third World countries, household food consumption and nutritional status vary widely from season to season. This book brings together authorities from a broad range of disciplines to analyze the causes and consequences of this seasonal food insecurity and discuss policy options that could help solve the problem.

Order all four books from publisher:

The Johns Hopkins University Press
701 W. 40th Street
Suite 275
Baltimore, MD 21211, USA

Books also available in England at the following address:

Trevor Brown Associates
Suite 7
Charing Cross Road
London WC2H 0LN

For selected books the publisher in India is:

Oxford University Press
YMCA Library Building
Jai Singh Road
Post Box No. 43
New Delhi 110001, INDIA

"Gray" Report Series

J.S. Sarma

Contingency Planning for Famines and Other Acute Food Shortages: A Brief Review

April 1983. 28 pages. 21.59 x 27.94 cm. Available as a photocopy,

This paper reviews the roles and functions of international agencies dealing with acute food shortages caused by droughts, cyclones, floods, etc. It suggests areas of research that various national and international agencies might undertake.

Ojetunji Aboyade

Administering Food Producer Prices in Africa: Lessons from International Experiences

December 1985. 58 pages. 21.59 x 27.94 cm. Available as a photocopy. ISBN 0-89629-304-1,

This work explores the possible effects of increasing price incentives to farmers in sub-Saharan Africa. The institutional factors and administrative arrangements necessary for a viable producer-price incentive system are examined against the background of case-study experiences in Africa and Asia.

Harold Alderman

The Effect of Food Price and Income Changes on the Acquisition of Food by Low-Income Households

May 1986. 100 pages. 21.59 x 27.94 cm. Available as a photocopy. ISBN 0-89689-305-X.

This paper reviews the methodological approaches used and the empirical results obtained in quantifying the extent to which the poor are more responsive to price changes than wealthier consumers. It identifies generalizable findings that may be used to approximate price responses and provides insights into the adjustments low-income households make in food consumption in response to price changes.

Bruce Stone, editor

Fertilizer Pricing Policy in Bangladesh

December 1987. 457 pages. 21.59 x 27.94 cm. Perfect. ISBN 0-89629-308-4.

These collected papers represent part of the output from a collaborative effort commissioned by the Bangladesh Ministry of Agriculture and organized by IFPRI and the Bangladesh Institute of Development Studies. The work analyzes policy issues relevant to sustained rapid growth in Bangladesh's fertilizer consumption.

Peter Oram

Prospects for Agricultural Production and Food Deficits in West Asia and North Africa: The Role of High Elevation Areas

April 1988. 63 pages. 21.59 x 27.94 cm. Saddle stitched. ISBN 0-89629-309-2.

This paper, prepared for a meeting held in Ankara sponsored jointly by the Turkish Ministry of Agriculture and the International Center for Agricultural Research in the Dry Areas, reviews progress in agricultural production in West Asia and North Africa and identifies the main constraints to growth, with particular reference to the problems of the high elevation areas.

Leonardo A. Paulino and J. S. Sarma

Analysis of Trends and Projections of Food Production and Consumption in Brazil and Nigeria

Ma 1988. 71 pages. 21.59 x 27.94 cm. Saddle stitched. ISBN 0-8963-310-6.

This study attempts a detailed analysis of food trends in Brazil and Nigeria by using data from the national systems of these countries to supplement food statistics available from international sources. It aims to use these trends to improve the assessments of the future food situation in Brazil and Nigeria that were made in an earlier food gap study by IFPRI and to examine the policy implications of the observed trends and food projections.

J.S. Sarma, ed.

Summary Proceedings of a Workshop on Trends and Prospects of Cassava in the Third World

July 1989. 195 pages. 15 x 23 cm. Perfect. ISBN 0-89629-311-4.

This summary proceedings presents an overview of the world cassava situation, a description of the Delphi survey used to collect information for the workshop, and papers on cassava use in Africa

and Latin America, including summaries of six case studies published by IFPRI as working papers.

Michel Petit

Pressures on Europe's Common Agricultural Policy

October 1989. 39 pages. 21.59 x 27.94 cm. Saddle stitched. ISBN 0-89629-312-2.

It is important to understand how policy decisions come about in developed countries—given their impact on developing countries. This study traces three changes in economic policy involving the European Community and the United States.

Working Papers on Commercialization of Agriculture and Nutrition

This series of working papers is intended to meet requests for additional information on commercialization of semisubsistence agriculture in various countries. These working papers complement IFPRI's research reports by providing detailed but primarily descriptive analyses.

No. 1

Joachim von Braun and Eileen Kennedy

Commercialization of Subsistence Agriculture: Income and Nutritional Effects in Developing Countries

April 1986. 79 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 2

Harold Alderman, George Mergos, and Roger Slade

Cooperatives and the Commercialization of Milk Production in India: A Literature Review

August 1987. 90 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 3

Patrick Webb

**Intrahousehold Decision making and Resource Control:
The Effects of Rice Commercialization in West Africa**

February 1989. 108 pages. 21.59 x 27.94 cm. Perfect.

No. 4

Joachim von Braun, Ken Johm, Sambou Kinteh, and Detlev Puetz

**Structural Adjustment, Agriculture, and Nutrition: Policy
Implications in the Gambia**

April 1990. 98 pages. 21.59 x 27.94 cm. Saddle stitched.

Working Papers on Food Subsidies

This working paper series was initiated to meet requests for additional information on the nature, implementation, and effects of subsidies in various countries. The food subsidy papers complement IFPRI's research reports on the subject by providing detailed descriptive analyses of operational and implementation issues and impact.

No. 1

P.S. George

**Aspects of Public Sector Procurement and Distribution
of Foodgrains in India**

August 1985. 97 pages. 21.59 x 27.94 cm. Perfect.

No. 2

Grant M. Scobie

Food Subsidies and the Government Budget in Egypt

November 1985. 40 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 3

Nora Lustig

Food Subsidy Programs in Mexico

January 1986. 44 pages. 21.59 x 27.94 cm. Saddle stitched,

No. 4

Harold Alderman, M. Ghaffar Chaudhry, and Marito Garcia

Household Food Security in Pakistan: The Ration Shop System

May 1988. 72 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 5

Ahmed Mahmoud Elminiawy

The Egyptian Rice Market: A Model Analysis of the Effects of Government interventions and Subsidies

September 1989. 105 pages. 21.59 x 27.94 cm. Perfect.

Working Papers on Cassava

To assess the prospects of cassava in the Third World, IFPRI has examined international data at the global and regional levels, with case studies in six countries. These studies have been published as a series of working papers. The proceedings of a conference on cassava will be published in the "gray" report series.

No. 1

P.S. George

Trends and Prospects for Cassava in India

May 1988. 74 pages, 21.59 x 27.94 cm. Saddle stitched.

No. 2

Liborio S. Cabanilla

Trends and Prospects for Cassava in the Philippines

July 1988.68 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 3

Faisal Kasryno

Trends and Prospects for Cassava in Indonesia

December 1988. 106 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 4

Tshikala Tshibaka and Kamanda Lumpungu

Trends and Prospects for Cassava in Zaire

February 1989. 45 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 5

S.O. Adamu

Trends and Prospects for Cassava in Nigeria

May 1989. 104 pages. 21.59 x 27.94 cm. Saddle stitched.

No. 6

Chaiwat Konjing

Trends and Prospects for Cassava in Thailand

June 1989.77 pages. 21.59 x 27.94 cm. Saddle stitched.

Abstracts and Newsletters

Various Authors, IFPRI

IFPRI Abstract

About seven/year since August 1980.4 pages. 21.59 x 27.94 cm.

The abstracts summarize the results and highlight the policy implications contained in the research reports published by IFPRI. Available in French and Spanish beginning with number 26.

IFPRI Report

Four times a year. 4 pages. 21.59 x 27.94 cm.

Each issue of IFPRI's newsletter contains a commentary on a specific food policy issue written by a member of IFPRI's senior research staff and reports on completed and soon-to-be-completed research. Available in French and Spanish.

IFPRI Reprints

IFPRI reprints a number of articles that IFPRI researchers publish in journals and other publications.

IFPRI Policy Briefs and Food Policy Statements

Various authors, IFPRI.

IFPRI Policy Briefs encapsulate recent research findings on specific topics of interest to policymakers that may not yet be available in published form. The *Food Policy Statements* provide in-depth overviews of specific policy issues and the global policy environment.

IITA

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About IITA

The International Institute of Tropical Agriculture is a non-profit research and training institute established in 1967 under the laws of the Federal Republic of Nigeria. Like its other 12 sister institutions, IITA is principally financed through the Consultative Group on International Agricultural Research which is an informal group of donor countries, development banks, foundations, and agencies.

The mandate

IITA is responsible for developing viable alternatives to shifting cultivation in the humid and sub-humid tropics. Also, the Institute has a global mandate for research to improve cowpeas, yams, and sweet potatoes as well as carrying out research in Africa on maize, rice, cassava, and soybean. It organizes training, conferences, and workshops to increase the number of well qualified persons to carry out research and development.

Books published by commercial companies should be obtained through the book stores.

ANNUAL REPORTS AND PERIODICALS

IITA Annual Report and Research Highlights

(French: Rapport annuel et Point de la recherche de l'IITA)
150 p. (approx.). 17.5 x 22.5 cm. Paperback. ISSN 03314340.
Free.

Published annually for years 1985 to 1987/88. Includes summary annual reports and highlights from IITA research programs on biological control, genetic resources, grain legume improvement, international cooperation and training, maize research, resource and crop management, rice research, root and tuber improvement; virology.

IITA Annual Report 1988/89

80 p. 21 x 29 cm. Paperback. ISBN 978-131-048-0. Free.

Descriptive report and policy perspectives on IITA research in tropical African agriculture. Includes the director general's review of traditional agricultural transformation; articles on interdisciplinary research (alley farming, biotechnology, postharvest technology and sweet potato research); and summary annual reports and highlights from IITA research programs (biological control; genetic resources;

grain legume improvement; international cooperation and training; maize research; resource and crop management; rice research; root, tuber and plantain improvement; virology) and technical and information support services.

Research Briefs (French: Echo de l'Ita)

[As listed in earlier CGIAR catalogs.]

Monographs

I. Okezie Akobundu

Weed Science In the Tropics: Principles and Practices

1987. 538 p. 15.5 x 23.5 cm. Hardcover. ISBN 0-471-91544-0. A Wiley-InterScience Publication. John Wiley & Sons. Available from the publisher or IITA. US\$35.00.

Excessive weed growth is one of the most serious problems facing farmers throughout the tropics. There is a need for professionally trained weed scientists to become involved in research at the highest level, where existing technologies can be further developed and new ones generated. The book considers in depth the concepts, principles and practices of tropical agriculture and introduces students and teachers to weed science as an integral part of a crop protection program.

S.R. Singh and K.O. Rachie (eds.)

Cowpea Research, Production and Utilization

1985. 488 p. 15.5 x 23.5 cm. Hardcover. ISBN 0-471-90802-9. A Wiley-Interscience Publication. John Wiley & Sons. Available from the publisher or IITA. US\$35.00.

Cowpea (*Vigna unguiculata* [L.]) is a highly nutritious grain legume particularly suited to the stressful growing conditions of tropical Africa, Asia, Latin America and USA. The first World Cowpea Research Conference was held at IITA during November 1984. The proceedings are presented in this book. They drawtogether current work on cowpea taxonomy, genetics, physiology, pathology, breeding, entomology, agronomy, nutrition and processing, and constitute an invaluable information resource for agricultural researchers, administrators, and funding agencies.

S.R. Singh, K.O. Rachie, and K.E. Dashiell (eds.)

Soybeans for the Tropics: Research, Production, and Utilization

1987. 250 p. 15 x 23.5 cm. Hardcover. ISBN 0-471-91419-3. A Wiley-InterScience Publication. John Wiley & Sons. Available from the publisher or IITA. L22.50.

This volume reviews the constraints in soybean production and utilization in the tropics (including low yields, seed viability, bacterial nodulation, and pod shattering) and research being conducted to overcome them. It highlights current efforts in breeding in the tropics and progress in research on pest, disease and weed control and agronomic practices. It reports, as well, on the status of soybean research in the different regions of the tropics.

I. Okezie Akobundu and C.W. Agyakwa

A Handbook of West African Weeds (French: Guide des adventices d'Afrique de l'Ouest)

1987. (French 1989.) 521 p. 15.5 x 22 cm. Paperback. ISBN 978-131-014-6. (French ISBN 978-131-036-7.) IITA. US\$16.00.

From a survey of common weeds found in field crops and fallows in West African countries from Senegal to Nigeria, photographs of 256 species are presented here in two parts: (a) major aquatic weeds in lowland rice ecosystems and (b) dryland weeds of field and plantation crops. A glossary, bibliography and index are included.

J.S. Yaninek and H.R. Herren (eds.)

Biological Control: a Sustainable Solution to Crop Pest Problems In Africa

1989. 222 p. 15 x 23 cm. Paperback. ISBN 978-131-039-1. IITA. Free.

This volume contains the proceedings of the conference on the search for sustainable solutions to crop pest problems in Africa and the workshop on selected issues in the application of biological control in Africa. Both meetings were held between 5 and 9 December 1988 at the IITA Biological Control Program headquarters at the IITA Benin Station in Cotonou, Republic of Benin.

Natalie D. Hahn (ed.)

in Praise of Cassava

1989. 250 p. 14 x 21 cm. Paperback. UNICEF ISBN 978-30600-1-7 and IITA ISBN 978-131-034-0. IITA/UNICEF Household Food Security and Nutrition Program. Available from IITA or UNICEF Nigeria Country Office, 11a Osborne Road, P.O. Box 1282, Ikoyi, Lagos, Nigeria.

The Interregional Experts' Group Meeting on the Exchange of Technologies for Cassava Processing Equipment and Food Production was held from 13 to 19 April 1988 at IITA. This volume of proceedings presents papers on cassava food products, improved technologies for processing of cassava and improved cassava varieties, together with country reports from Fiji, Ghana, India, and Sierra Leone.

A.S.R. Juo and J.A. Lowe (eds.)

The Wetlands and Rice in Sub-Saharan Africa

1986. 318 p. 15 x 23 cm. Paperback. IITA. Free.

The proceedings of an international conference on wetland utilization for rice production in sub-Saharan Africa in this volume present recent advances in research and development of the wetlands and rice, as well as the feasibility of adapting some of the Asian rice-growing techniques to African conditions.

BOOKLETS AND BROCHURES

Laurence D. Stifel

UTA Research for Sustainable Agriculture in Africa

1990. 28 p. 9 x 21 cm. Saddle stitched. IITA. Free.

Twenty-three years ago IITA was founded with the goal of developing sustainable agricultural systems to replace bush fallow, or slash-and-burn, cultivation in tropical Africa, and to increase the productivity of key food crops in those systems. The present paper, the text of the director general's presentation to the CGIAR at International Centers Week on 2 November 1989, describes how IITA scientists are grappling with sustainability problems and what breakthroughs they have achieved.

International Institute of Tropical Agriculture

Genetic Resources for Tropical Agriculture

1988. (French in press.) 32 p. 17 x 23 cm. Saddle stitched. ISBN 978-131-0314. (French ISBN 978-131-0324) Free.

This booklet serves as an introduction to the subject as it applies in Africa and to the work of the IITA Genetic Resources Unit. Written for the interested layman as well as the specialist, it describes recent achievements and activities in germplasm collection, conservation, evaluation, documentation, and distribution.

International Institute of Tropical Agriculture

The Use of Biotechnology for the improvement of Cassava, Yams and Plantain in Africa

1988. 79 p. 14 x 21 cm. Saddle stitched. ISBN 978-131-033-2. IITA Meeting Report Series 1988/2. Free.

IITA and other African research institutions met on 8 and 9 August 1988 to discuss the use of biotechnology for the improvement of cassava, yams, and plantain. This volume of selected contributions by the participants was published to promote awareness of African initiatives in the subject field and to broaden the base for collaboration.

International Institute of Tropical Agriculture

Training Opportunities at IITA

1988. 12 p. 16 x 24 cm. Saddle stitched. Free.

Training is one of IITA's principal means of "Transferring technology" in agricultural to African tropical developing countries. Training can help in building national capabilities for agricultural research and food production. IITA offers several degree-related and non-degree-related training activities within its research program on cassava, cowpea, maize, soybean, yam, plantain and biological control of insect pests, and research farm management.

International Institute of Tropical Agriculture

Cowpea Research at IITA

GLIP Research Monograph No. 1

1989 (revised edition). 23 p. 13.5 x 21 cm. Paperback. Free.

With a world mandate for cowpea research, IITA has collected and improved cowpea germplasm over two decades. From an approach of pyramiding genes for disease and pest resistance, IITA cowpea research has evolved to developing the crop in its agroecological context and solving problems within cowpea cropping systems.

International Institute of Tropical Agriculture

Soybean Research at IITA

GLIP Research Monograph No. 2

1990.23 p. 13.5 x 21 cm. Paperback. Free.

With a mandate for genetic improvement of soybean for tropical Africa, over the past two decades IITA has solved the three major constraints in soybean production and utilization: (a) rapid loss of seed viability under ambient storage conditions, resulting in poor germination rates; (b) poor nodulation and thus poor nitrogen fixation; (c) little information on processing and cooking methods, thus little market demand for the crop. IITA has developed promiscuous soybeans which nodulate freely with indigenous bacteria and process increased seed storability and resistance to pod-shattering. IITA works with national programs to develop suitable methods of soybean processing and cooking.

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ILCA

ILCA's formal mandate is ... to assist national efforts which aim to effect a change in production and marketing systems in tropical Africa so as to increase the sustained yield and output of livestock products and improve the quality of the life of the people of this region

ILCA's objectives

ILCA is an international centre of livestock research, training and information. Through research, it seeks to increase the production and sale of livestock and livestock products. This research effort is supported by extensive publishing and documentation services and by training programmes for research workers in African national agricultural research systems (NARS). ILCA concentrates its research on three ruminant species: cattle, sheep and goats. Smallholders and agropastoralists are the two target groups on which ILCA focuses its work in the four ecological zones with the highest potential for substantial impact on food production: semi-arid, subhumid, humid and highland. ILCA also concentrates on four major outputs of livestock: milk, meat, traction and manure. Given these choices, ILCA has selected six research thrusts as the major areas of work: cattle milk and meat, small ruminant meat and milk, animal traction, animal feed resources, trypanotolerance, and livestock policy and resource use.

ILCA'S PUBLICATIONS

This catalogue is a complete list of ILCA publications.

Most ILCA publications - Annual Reports, Research Reports, Systems Studies, Monographs, Manuals and Periodicals - are published in both English and French, and details of each version are given. If a publication has been published in one language only, no bibliographic details or abstract in the other language is given.

Conference and Workshop Proceedings are generally published in only one language. In some, however, the papers presented at the meeting are published in the original language, with summaries in both languages.

Bibliographies contain citations published in the original language. Bibliographic details and abstracts of these Bibliographies are therefore given in both English and French.

Microfiche indexes are catalogues of documents collected and microfiched in various African countries. Catalogues of literature from anglophone countries are published in English, and from

francophone countries in French, and English and French catalogues are listed separately.

Annual Reports

ILCA

ILCA Annual Report 1988

1989.xviii + 156 pages. Paperback. 24.5 x 18.5 cm. ISSN0255-0040. Free (Previous issues of ILCA Annual Report are now available only on microfiche).

Highlights ILCA's research at headquarters and at its field research programmes in Ethiopia, The Gambia, Kenya, Mali, Niger and Nigeria on livestock economics and policy, trypanotolerance, forage agronomy, small ruminants, soils and plant nutrition, as well as the Centre's work on training and information.

Available in English and French.

Research Reports

C. de Mongolfier-Kouevi et A. Vlavonou

CIPEA rapport de recherche 1. *Tendances et perspectives de l'agriculture et de l'élevage en Afrique sub-saharienne*

1983. vi + 61 pages. Broche. 25.5 x 17.3. ISBN 92-9053-046-4, Desormais disponible sous forme de microfiche uniquement: ISBN 92-9053-173-8.5 \$E.-U. (port avion inclus).

Ce rapport presente une etude des tendances passees et des perspectives du developpement de l'élevage en Afrique sub-saharienne. Une analyse et une projection a l'an 2000 des perspectives de l'offre et de la demande ont ete faites sur la base des ressources disponibles et potentielles. Une attention particuliere a ete accordee au role de la production animale dans le secteur agricole (utilisation du fumier et de la traction animale).

En francais.

P.A. Konandreas and F.M. Anderson

ILCA Research Report 2. Cattle herd dynamics: An integer and stochastic model for evaluating production alternatives

1983. vii + 95 pages. Paperback. 25.5 x 17.7 cm. ISBN 92-9053-016-2 (E) and ISBN 92-9053-041-3 (F). Also available on microfiche: ISBN 92-9053-107-X (E) and ISBN 92-9053-174-6 (F). US\$10.00 (including airmail postage).

Presents the rationale and formal specifications of a simulation model used to evaluate cattle herd production dynamics. In the model a herd is simultaneously represented as both a biological and an economic unit. The analytical background and the model are explained in detail and the simulation of feed intake, growth and milk production, reproduction and mortality is discussed. The policy options in herd management are also presented.

Available in English and French.

A. Fall, M. Diop, J. Sandford, Y.J. Wissocq, J. Durkin and J.C.M. Trail

ILCA Research Report 3. Evaluation of the productivities of Djallonke sheep and N'Dama cattle at the Centre de recherches zootechniques, Kolda, Senegal

1982. v + 70 pages. Paperback. 25.5 x 17.3 cm. ISBN 92-9053-020-0 (E) and ISBN 92-9053-021-9 (F). Also available on microfiche: ISBN 92-9053-108-8(E) and ISBN 92-9053-175-4 (F). US\$10.00 (including airmail postage).

Reports the analysis of productivity data collected up to 1981 on reproductive performance, viability and growth performance traits of Djallonke sheep and N'Dama cattle at the Centre de recherches zootechniques, Kolda in Senegal. These traits are used to build overall indices for the two species.

Available in English and French.

G. Gryseels and F.M. Anderson

ILCA Research Report 4. Research on farm and live-stock productivity in the central Ethiopian highlands: Initial results, 1977-1980

1983. vii + 52 pages. Paperback. 25.5 x 17.5 cm. ISBN 92-9053-044-8 (E) and ISBN 92-9053-067-7 (F). Also available on microfiche: ISBN

92-9053-109-6 (E) and ISBN 92-9053-176-2 (F), US\$10.00 (including airmail postage).

ILCAs studies on the traditional smallholder production Systems of the highlands analyse productivity aspects of the system's crop and livestock components. Results of research on innovations are given and the approach to farming systems research with special reference, to livestock is discussed, together with the Implications for adoption of this approach by a national agency.

Available in English and French.

R.T. Wilson, P.N. de Leeuw et C. de Haan (sous la direction de)

CIPEA rapport de recherche, 5. *Recherches sur les systemes des zones arides du Mali: resultats preliminaires*

1983. viii + 189 pages. Broche. 25.5 x 17.5. ISBN 92-9053-031-6. Egalement disponible sous forme de microfiche: ISBN 92-9053-117-0. 12\$E.-U. (port avion inclus).

Ce rapport decrit les systemes extensifs traditionnels de production agropastorale et pastorale dans le delta interieur du Niger, ainsi que les contraintes a l'accroissement de leur productivite. Les ressources fourrageres, la production animale, la production agricole, l'economie villageoise et l'organisation socio-territoriale sont analysees et des conclusions generales sur l'orientation des recherches futures sont esquissees.

En francais.

KA. Edwards, G.A. Classen and E.H.J. Schroten

ILCA Research Report 6. *The water resource in tropical Africa and its exploitation*

1983. vii + 103 pages. Paperback. 25.5 x 17.5 cm. ISBN 92-9053-043-X (E) and ISBN 92-9053-052-9 (F). Also available on microfiche: ISBN 92-9053-110-X (E) and ISBN 92-9053-178-9 (F). US\$26.00 (including airmail postage).

Deals with the mechanics of the hydrological cycle, the origins of the wide variations in rainfall, the potential for water resource development in pastoral areas, and low-cost methods of exploiting these resources. Problems of water quality are also outlined.

Available in English and French.

J.M. King

ILCA Research Report 7. *Livestock wafer needs in pastoral Africa in relation to climate and forage*

1983. ix + 95 pages. Paper back. 25.5 x 17 cm. ISBN 92-9053-037-5 (E) and ISBN 9053-059-6(F). Also available on microfiche: ISBN 92-9053-1118(E) and ISBN 92-9053-179-7(F). US\$18.00 (including airmail postage).

Gives a detailed discussion of the physiology of water and energy use in the herbivore, and a diagram of the interrelation between the two. The information on water and energy use by livestock in the traditional pastoral system has been applied to water and livestock development in the context of range, woodland, and livestock management.

Available in English and French.

S. Sandford

ILCA Research Report 8. Organisation and management of water supplies in tropical Africa

1983. vi + 45 pages. Paperback. 25.5 x 17.3 cm. ISBN 92-9053-042-1 (E) and ISBN 92-9053-060-X (F). Also available on microfiche: ISBN 92-9053-112-6 and ISBN 92-9053-1804 (F). US\$ 14.00 (including airmail postage).

Discusses traditional and modern strategies used to overcome water shortages. Outlines the technical, administrative and environmental problems experienced in the past development of water supplies, and the relationship between technology, equity, management and control. The implications of past experience for planning future water development are considered.

Available in English and French.

J.C.M. Trail, K. Sones, J.M.C. Jibbo, J. Durkin, D.E. Light and M. Murray

ILCA Research Report 9. Productivity of Boran cattle maintained by chemoprophylaxis under t-rypanosomiasis risk

1985. x + 76 pages. Paperback. 25.5 x 17.5 cm. ISBN 92-9053-056-1 (E) and ISBN 92-9053-071-5 (F). Also available on microfiche: ISBN 92-9053-113-4 (E) and ISBN 92-9053-181-9 (F). US\$10.00 (including airmail postage).

Detailed analysis of the performance of Boran cattle has shown that prophylactic drugs can be used successfully in an area of high tsetse challenge. Over 20,000 calving records collected over a 10-year period at Mkwaja Ranch in Tanzania are analysed.

Available in English and French.

P.A. Konandreas, F.M. Anderson and J.C.M. Trail

ILCA Research Report 10. Economic trade-offs between milk and meat production under various supplementation levels in Botswana

1983. v + . 52 pages. Paperback. 25.5 x 17 cm. ISBN 92-9053-034-0. Also available on microfiche: ISBN 92-9053-114-2. US\$ 10.00 (including airmail postage).

Adynamic and stochastic cattle simulation model is briefly described and validated for production conditions in a study area in Botswana using Tswana and Simmental x Tswana cattle. The performances of the two genotypes under various milking and supplementation policies are compared, and the economic trade-offs between milk and meat production are presented. An optimum production strategy is defined, and policy options for the development of Botswana's dairying sector are outlined.

Available in English.

G.H. Kiwuwa, J.C.M. Trail, M.Y. Kurtu, Getachew Worku, F.M. Anderson and J. Durkin

ILCA Research Report 11. Crossbred dairy cattle productivity in Arsi Region, Ethiopia

1983. vi + 29 pages. Paperback. 25.5 x 17.3 cm. ISBN 92-9053-036-7 (E) and ISBN 98-9053-078-2 (F). Also available on microfiche: ISBN 92-9053-115-0 (E) and ISBN 92-9053-182-7 (F). US\$7.00 (including airmail postage).

Presents results of analyses on a range of performance traits and productivity estimates for indigenous Arsi and Zebu cattle and eight different grades of crosses of these with Jersey and Friesian, maintained for milk production. Data were collected from animals kept at Asela station and smallholder farms in the Arsi Region of Ethiopia in the period 1968-81.

Available in English and French.

K. Agyemang and L.P. Nkhonjera

IICA Research Report 12. *Evaluation of the productivity of crossbred dairy cattle on smallholder and government farms in the Republic of Malawi*

1986. viii + 39 pages. Paperback. 25.5 x 17.3 cm. ISBN 92-9053-072-3. Also available on microfiche: ISBN 92-9053-116-9. US\$ 8.00 (including airmail postage).

Evaluates reproductive and productive performance of crossbred cows on smallholder farms in the southern region of Malawi. The performance of crossbred cows on three research stations, as well as that of the pure-Friesian herd at Mikolongwe, was also studied.

Available in English.

K.T. Wagenaar, A. Diallo and A.R. Sayers

ILCA Research Report 13. *Productivity of transhumant Fulani cattle in the inner Niger delta of Mali*

1986. ix + 57 pages. Paperback. 25.5 x 17.5 cm. ISBN 92-9053-079-0 (E) and ISBN 98-9053090-1 (F). Also available on microfiche: ISBN 92-9053-117-7 (E) and ISBN 92-9053-1 83-5 (F). US\$ 10.00 (including airmail postage).

Evaluates a range of performance traits and the productivity of transhumant Sudanese Fulani Zebu cattle in the inner Niger delta of Mali. The analyses used data collected on 2550 animals in three herds studied in 1978-83. The results of the study are compared with findings reported in the literature on Sudanese Fulani cattle in Mali, the related White Fulani strain in Nigeria, and the Gobra in Senegal.

Available in English and French.

R.T. Wilson

ILCA Research Report 14. *Livestock production, in central Mali: Long-term studies on cattle and small ruminants in the agropastoral system*

1986. xi + 111 pages. Paperback. 25.5 x 17.3 cm. ISBN 92-9053081-2 (E) and ISBN 92-9053-089-8 (F). Also available on microfiche: ISBN 92-9053-1185(E) and ISBN 92-9053-184-3 (F). US\$14.00 (including airmail postage).

Describes the livestock production systems and management practices in central Mali, based on data collected from 1978 to mid-1984. Cattle and small ruminant productivity are discussed in detail.

Available in English and French.

Th. Murayi, A.R. Sayers et R.T. Wilson

CIPEA rapport de recherche 15. *La productivité des petits ruminants dans les stations de recherche de l'Institut des sciences agronomiques du Rwanda*

1987. x + 58 pages. Broche. 25.5 x 17.3. ISBN 92-9053-082-0. Egalement disponible sous forme de microfiche: ISBN 92-9053-185-1. 10 \$E.-U. (port avion inclus).

Ce rapport présente les résultats des analyses effectuées sur des données recueillies entre 1972 et 1984 dans les stations de recherche de l'Institut des sciences agronomiques du Rwanda. Divers aspects de la productivité des caprins et des ovins sont traités.

En français.

A.M. Saeed, P.N. Ward, D. Light, J.W. Durkin and R.T. Wilson

ILCA Research Report 16. *Characterisation of Kenana cattle at Um Banein, Sudan*

1987. viii + 46 pages. Paperback. 25.5 x 17.3 cm. ISBN 92-9053-086-3. Also available on microfiche: ISBN 92-9053-119-3. US\$ 8.00 (including airmail postage).

Presents results of analyses of data collected on Kenana cattle at Um Banein Livestock Research Station in Sudan from 1957 to 1984. Special emphasis is given to herd management, reproductive performance, weight and growth, milk production, and mortality and offtake. Future management and research strategies are suggested.

Available in English.

V.H. von Massow

ILCA Research Report 17. *Dairy imports into sub-Saharan Africa: Problems, policies and prospects*

1989. vi + 46 pages. Saddle stitched. 25.5 x 17.5cm. ISBN 92-9053-098-7 (E) and ISBN 92-9053-101-0 (F). Also available on microfiche: ISBN 92-9053-120-7 (E) and ISBN 92-9053-186-X (F). US\$ 12.50 (including airmail postage).

Reviews the trends in the production and consumption of dairy products in sub-Saharan Africa as well as the growing importance of dairy products in meeting consumption targets. The basic instruments of dairy import policy, their objectives, and the economic effects of selected import measures are outlined; and detailed studies of two specific dairy policies - the classical trade control policy pursued in Nigeria and the multi-objective policy of Mali - are presented.

Available in English and French.

Systems Studies

ILCA and Animal Production Research Unit, Ministry of Agriculture, Botswana

ILCA Systems Study 1. Mathematical modelling of livestock production systems: Application of the Texas A & M University beef cattle production model to Botswana

1978. vi + 102 pages. Originally in paperback. 29.9 x 20.8 cm. ISBN 92-9053-002-2 (E) and ISBN 92-9053-026-X (F). Now available only on microfiche: ISBN 92-9053-121-5 (E) and ISBN 92-9053-18743 (F). US\$8.00 (including airmail postage).

Describes the application of the Texas A & M University model to the traditional production system and an improved ranching system in Botswana. The exercise demonstrates the potential contribution of mathematical modelling as an aid to livestock production research and related development problems.

Available in English and French.

ILCA

ILCA Systems Study 2. Livestock production in the sub-humid zone of West Africa: A regional review

1979. 184 pages. Originally in paperback. 29.7 x 21 cm. ISBN 92-9053-005-7 (E) and ISBN 92-9053-050-2 (F). Now available only on microfiche: ISBN 92-9053-122-3 (E) and ISBN 92-9053-188-6 (F). US\$ 10.00 (including airmail postage).

Describes the environment, animal and fodder resources, and the management practices of the livestock producers in the subhumid zone of West Africa. Tsetse-transmitted trypanosomiasis and other

animal diseases of major economic importance are also discussed. Land-use development strategies as well as further research options are examined.

Available in English and French.

ILCA

ILCA Systems Study 3. *Small ruminant production in the humid tropics*

1979. iv + 122 pages. Originally in paperback. 29.7 x 20.7 cm. ISBN 92-9053-006-5 (E) and ISBN 92-9053-035-9 (F). Now available only on microfiche: ISBN 92-9053-123-1 (E) and ISBN 92-9053-189-4 (F). US\$9.00 (including airmail postage).

Reviews sheep and goat production systems in the humid zone of West Africa. The study is based on a survey conducted by an ILCA team in Cote d'Ivoire, Ghana, Togo and Nigeria which focused on management practices, production parameters, feeding and breeding strategies, the incidence of disease, and the socioeconomic aspects of small ruminant production.

Available in English and French.

Monographs

ILCA and Institut d'économie rurale du Mali

ILCA Monograph 1. *Evaluation of the productivities of Maure and Peul cattle breeds at the Sahelian Station, Niono, Mali*

1978. iv + 109 pages. Originally in paperback. 29.2 x 20.7 cm. ISBN 92-9053-003-0 (E) and ISBN 92-9053-004-9 (F). Now available only on microfiche: ISBN 92-9053-124-X (E) and ISBN 92-9053-190-8 (F). US\$7.00 (including airmail postage).

Provides information on the productivity of two African cattle breeds and some of their crosses used at the Station d'élevage et de recherches zootechniques du sahel in Mali. Among the traits analysed are reproductivity, milk yield and composition, mortality, body weight, and various body measurements. The results are compared to those from production systems found in comparable environments elsewhere in Africa.

Available in English and French.

J.C.M. Trail, C.H. Hoste and Y.J. Wissocq

ILCA Monograph 2. *Trypanotolerant livestock in West & central Africa*

Vol 1. General study

1979. x + 147 pages. Originally in paperback. 29.7 x 20.7 cm. ISBN 92-9053-007-3 (E) and ISBN 92-985x009-X (F). Now available only on microfiche: ISBN 92-9053-125-8 (E) and ISBN 92-9053-191-6 (F). US\$ 9.00 (including airmail postage).

Ph. Lhoste and I.L. Mason

Vol2. Country studies

1979. vi + 303 pages. Originally in paperback. 29.7 x 21 cm. ISBN 92-9053-008-1 (E) and ISBN 92-9053-010-3 (F). Now available only on microfiche: ISBN 92-9053-126-6 (E) and ISBN 92-9053-192-4 (F). US\$ 12.00 (including airmail postage).

Presents a review of trypanotolerant livestock in West and central Africa. Volume 1 deals with their classification, distribution and description in general terms; volume 2 gives more detailed information on the state of trypanotolerant livestock in each of the 18 countries studied. Possible research and development activities are also discussed.

Available in English and French.

J.C.M. Trail and K.E. Gregory

ILCA Monograph 3. *Sahiwal cattle: An evaluation of their potential contribution to milk and beef production in Africa*

1981. vii + 128 pages. Originally in paperback. 29.7 x 21 cm. ISBN 92-9053-011-1 (E) and ISBN 92-9053819-7 (F). Now available only on microfiche: ISBN 92-9053-127-4 (E) and ISBN 92-9053-193-2 (F). US\$8.00 (including airmail postage).

Evaluates the potential for both milk and meat production of the Sahiwal cattle breed and its crosses with *Bos taurus* and indigenous *Bos indicus* breeds in various African environments. The data are from five ranches in Kenya where cattle are reared under different environmental conditions and with different production objectives.

Available in English and French.

J.J.R. Grimsdell and S. Westley (Editors)

ILCA Monograph 4. *Low level aerial survey techniques*

1981. vi + 243 pages. Originally in paperback. 29.7 x 20.7 cm. ISBN 92-9053412-X (E) and ISBN 92-9853-075-8 (F). Now available only on microfiche: ISBN 92-9053-128-2 (E) and ISBN 92-9053-194-0 (F). US\$ 10.00 (including airmail postage).

Based on workshop papers and discussion summaries on the development of low-level aerial survey techniques and their present application to livestock, wildlife and land-use evaluation, this monograph reviews survey designs and sampling procedures. Problems of bias, information transfer and coordination with information collected at other survey levels are discussed.

Available in English and French.

E. Mukasa-Mugerwa

ILCA Monograph 5. *The camel (Camelus dromedarius): A bibliographical review*

1981. vii + 147 pages. Originally in paperback. 29.7 x 20.7 cm. ISBN 92-9053413-8 (E) and ISBN 98-9053-062-6 (F). Now available only on microfiche: ISBN 92-9053-129-0 (E) and ISBN 92-9053-195-9 (F). US\$9.00 (including airmail postage).

Assesses the present performance and productive potential of the dromedary. Describes the origins and distribution of camel breeds, their reproductive performance and nutritional requirements, as well as common camel diseases. The camel's suitability for milk and meat production and transport, the use of camel hair and hides, and management and socioeconomic factors are discussed.

Available in English and French.

E. Mukasa-Mugerwa

ILCA Monograph 6. *A review of reproductive performance of female Bos Indicus (zebu) cattle*

1989. x + 134 pages. Paperback. 25.5 x 17.4 cm. ISBN 92-9053-099-5. Also available on microfiche: ISBN 92-9053-130-4. US\$ 32.00 (including airmail postage).

Gives an account of current information on factors affecting reproduction in female zebu cattle. Includes a summary of basic reproductive anatomy and endocrinology, followed by in-depth reviews of the

effects of nutrition, genetics, herd management and disease on overall reproductive performance in this type of cattle.

Available in English.

Rui Miranda

CIPEA monographie 7. *Role des ligneux fourragers dans la nutrition des ruminants en Afrique subsaharienne. Etude bibliographique*

1989. viii + 43 pages. Agrafe a cheval. 25.5 x 17.4. ISBN 92-9053-100-2. Egalement disponible sous forme de microfiche: ISBN 92-9053-196-7. 14.00 \$E.-U. (port avion inclus).

Cette monographie procede a un rapide examen sur l'importance des arbres et arbustes a usages multiples (AUM) comme source d'aliments pour les ruminants, sur la production primaire de ces plantes, et sur leur valeur nutritive et leur composition chimique. reevaluation du potentiel des ligneux fourragers dans le cadre des relations sols-plantes, et les techniques de laboratoire utilisees pour l'evaluation des ligneux sont aussi abordees.

En francais.

Conference and Workshop Proceedings

ILCA

Evaluation and mapping of tropical African rangelands

1975. xvi + 399 pages. Originally in paperback. 30 x 22 cm. ISBN 92-9053-000-6 (E) and ISBN 82-9053-001-4 (F). Now available only on microfiche: ISBN 92-9053-131-2 (E) and ISBN 92-9053-197-5 (F). US\$ 15.00 (including airmail postage).

Summarises the ILCA-sponsored seminar held in Bamako, Mali, in 1975. Presents a review of rangeland survey and evaluation techniques, discusses site development methods, sampling and data processing and transcription of data from aerial photographs to base maps and recommends guidelines for rangeland survey and evaluation in the future.

Available in English and French.

S.B. Westley (Editor)

East African pastoralism: Anthropological perspectives and development needs

1977. vi + 207 pages. Paperback. 29.3 x 20.8 cm. ISBN 92-9053-022-7. Also available on microfiche: ISBN 92-9053-132-0. US\$ 24.00 (including airmail postage).

A selection of 11 conference papers presenting ethnographic information on specific forms of pastoralism in eastern Africa, methodological problems in the collection and analysis of anthropological information, and theoretical issues in the study of society, as well as various ethical and policy problems facing development planners and administrators. The need to maintain an ecological balance in pastoral production systems under development is also discussed.

Available in English.

R.M. Gatenby and J.C.M. Trail (Editors)

Small ruminant breed productivity in Africa. Proceedings of a seminar held at ILCA, Addis Ababa, in October 1982

1982. 96 pages. Originally in paperback. 29.7 x 20.7 cm. ISBN 92-9053-023-5. Now available only on microfiche: ISBN 92-9053-133-9. US\$ 7.00 (including airmail postage).

Contains 11 papers presented at the ILCA Seminar on Small Ruminant Breed Productivity. The topics include breeding and production objectives, current research approaches in sub-Saharan Africa and other tropical areas, methods of collection and analysis of small ruminant production data, and a review of current research findings in Africa.

Available in English.

H.N. Le Houerou (Editor)

Browse in Africa: The current state of knowledge

1983. 491 pages. Paperback. 29.7 x 21 cm. ISBN 92-9053-025-1 (E) and ISBN 92-9053-039-1 (F). Also available on microfiche: ISBN A2-9053-134-7 (E) and ISBN 92-9053-198-3 (F). US\$ 56.00 (including airmail postage).

Reviews the current knowledge of browse and its role in the development of livestock production. Papers deal with the ecology of browse trees and shrubs, their geographical distribution, relative palatability

for different animals, and their composition and theoretical value. Other topics include the primary and secondary production of browse; its intensification through technically possible, economically viable, and socially acceptable operations; and the need for the regeneration of browse populations through appropriate management methods. Future research priorities are discussed.

Available in English and French.

ILCA

Pastoral systems research in sub-Saharan Africa. Proceedings of the workshop held at ILCA, Addis Ababa, Ethiopia, 27-24 March 1983

1983. vii + 480 pages; Originally in paperback. 29.7 x 20.9 cm. ISBN 92-9053-038-3. Now available only on microfiche: ISBN 92-9053-135-5. US\$ 18.00 (including airmail postage).

The workshop on Pastoral Systems Research in sub-Saharan Africa focused on the techniques and processes in pastoral systems research with particular reference to ILCA's experience in sub-Saharan Africa. Presentations appear in the author's original language, either English or French. Summaries of discussion sessions are in both English and French.

D.H. Hill (Editor)

Peste des petits ruminants (PPR) in sheep and goats. Proceedings of the international workshop held at IITA, Ibadan, Nigeria, 24-26 September 1980

1983. v + 104 pages. Paperback. 29.5 x 20.8 cm. ISBN 92-9053-040-5. Also available on microfiche: ISBN 92-9053-136-3. US\$ 15.00 (including airmail postage).

Summarises the epidemiology, symptomatology and diagnosis of peste des petits ruminants (PPR) in West Africa. The physicochemical and biological characters of the PPR virus and the role of other agents responsible for the pathogenesis of the disease are discussed and further policy directions and research are recommended.

Available in English.

J.E. Sumberg and K. Cassaday (Editors)

Sheep and goats in humid West Africa. Proceedings of the workshop on small ruminant production systems in the humid zone of West Africa, held in Ibadan, Nigeria, 23-26 January 1984

1985. v + 74 pages. Paperback. 29.7 x 20.7 cm. ISBN 92-9053-058-8. Also available on microfiche: ISBN 92-9053-137-1. US\$ 12.00 (including airmail postage).

Summarises research on dwarf sheep and goat production in humid West Africa. Among the topics discussed are disease profiles of village sheep and goats, integration of the small ruminant enterprise into the wider farming system of the zone, and the economics of the improved production systems of ruminants.

Available in English.

R.T. Wilson and D. Bourzat (Editors)

Small ruminants in African agriculture. Les petits ruminants dans l'agriculture africaine. Proceedings of a conference held at Addis Ababa, Ethiopia, 30 September-4 October 1985

1985. ix + 261 pages. Paperback. 29.7 x 20.8 cm. ISBN 92-9053-069-3. Also available on microfiche: ISBN 92-9053-138-X. US\$ 30.00 (including airmail postage).

Contains 24 papers (14 in English and 10 in French) which discuss goat and sheep research in 14 African countries. The role of these animals in a wide range of ecological zones and agricultural systems is described, as well as their reproductive and productive performance, nutrition, mortality and morbidity.

N. de Ridder, H. van Keulen, N.E. Seligman and P.J.H. Neate (Editors)

Modelling of extensive livestock production systems. Proceedings of the ILCA/ARO/CABO workshop held at ARO, Bet Dagan, Israel, 5-9 February 1985

1986. 349 pages. Originally in paperback. 29.7 x 21 cm. ISBN 92-9053-073-1 Now available only on microfiche: ISBN 92-9053-139-8. US\$16.00 (including airmail postage),

The workshop focused on four main aspects of modelling extensive livestock production systems: primary production, factors affecting

feed intake and its prediction, secondary production, and management and economics. The progress in this work at the three centres, as well as potential future developments, is discussed.

Available in English.

R. von Kaufmann, S. Chater and R. Blench (Editors)

Livestock systems research in Nigeria's subhumidzone. Proceedings of the second ILCA/NAPRI symposium held in Kaduna Nigeria, 29 October-2 November 1984

1986. xiii + 484 pages. Paperback. 29.7 x 21 cm. ISBN 92-9053-074-X. Also available on microfiche: ISBN 92-9053-140-1. US\$ 56.00 (including airmail postage).

Gives basic information about the systems studied and discusses the interactions between crop and livestock production, as well as the reactions of the Fufani agropastoralists participating in the research, and the role of national research institutes and extension services in ILCAs work.

Available in English.

I, Haque, S. Jutzi and P.J.H. Neate (Editors)

Potential of forage legumes in farming systems of sub-Saharan Africa. Proceedings of a workshop held at ILCA, Addis Ababa, Ethiopia, 16-19 September 1985

1986. xi + 569 pages. Originally in paperback. 21 x 14.8 cm. ISBN 92-9053-080-4. Now available only on microfiche: ISBN 92-90s-141-X. US\$22.00 (including airmail postage).

Contains 30 papers dealing with nutrient and water constraints to legume growth, and the role of forage legumes in production systems of sub-Saharan Africa and other parts of the world. Recommendations for future research are also presented.

Available in English.

I. Haque, S. Jutzi and P.J.H. Neate (sous la direction de)

Contribution potentielle des legumineuses fourrageres aux systemes agraires de l'Afrique au sud du Sahara. Actes du seminaire tenu au CIPEA, Addis-Abeba (Ethiopie) du 16 au 19 septembre 1985

1987. 29 pages. Agrafe acheval. 21 x 14.8. ISBN 92-9053-084-7. Also available on microfiche: ISBN 92-9053-199-1. Gratuit.

Cette brochure contient les resumes en francais des trente-six textes publies en anglais dans l'ouvrage cite ci-dessus. Les themes abordes traitent des contraintes a la croissance des legumineuses liees a la disponibilite de nutriments et d'eau, du role des legumineuses fourrageres dans les systemes de production, et des priorites a adopter pour programmer les recherches.

En francais.

J.D. Reed, B.S. Capper and P.J.H. Neate (Editors)

Plant breeding and the nutritive value of crop residues. Proceedings of a workshop held at ILCA, Addis Ababa, Ethiopia, 7-10 December 1987

1988. xi + 331 pages. Paperback. 21 x 14.7 cm. ISBN 92-9053-094-4. Also available on microfiche: ISBN 92-9053-142-8. US\$ 24.00 (including airmail postage).

Contains 12 papers dealing with the use of crop residues as livestock feed in smallholder crop-livestock farming systems, and the role of plant breeding in maintaining or improving their nutritive value.

Available in English.

S.C. Jutzi, I. Haque, J. McIntire and J.E.S. Stares (Editors)

Management of Vertisols in sub-Saharan Africa. Proceedings of a conference held at ILCA, Addis Ababa, Ethiopia, 31 August-4 September 1987

1988. xiii + 435 pages. Paperback 21 x 15cm. ISBN 92-9053-095-2. Also available on microfiche: ISBN 92-9053-1436. US\$31.00 (including airmail postage).

Contains 19 papers and 26 abstracts which review experience and progress in the improved use of African Vertisols and develop

important recommendations for future research and development of this resource.

Available in English.

Manuals

M.J. Nicholson and M.H. Butterworth

A guide to condition scoring of zebu cattle

1986. 29 pages. Saddle stitched. 15 x 21 cm. ISBN 92-9053-068-5. Also available on microfiche: ISBN 92-9053-144-4 (E) and ISBN 92-9053-200-9 (F). US\$5.00 (including airmail postage).

Gives background information on condition scoring and describes a 9-score method suitable for assessing body condition of *Bos indicus* (zebu) cattle in Africa. The various conditions are shown in black-and-white photographs in side and rear views of the scored animals. Also gives information on the statistical analysis of condition-scoring data.

Available in English and French.

Abiye Astatke, S. Bunning and F.M. Anderson

Building ponds with animal power in the Ethiopian highlands. A manual

1986. vi + 38 pages. Saddle stitched. 19.8 x 20.8 cm. ISBN 92-9053-070-7. Also available on microfiche: ISBN 92-9053-145-2. US\$ 11.00 (including airmail postage).

Many people throughout the developing world lack access to adequate water supplies for household consumption or for livestock. This problem can be alleviated by building ponds to trap surface runoff during the rainy season. This manual provides useful information and guidance to those involved in pond construction using animal power.

Available in English.

Training materials

M. Murray, J.C.M. Trail, D.A. Turner and Y. Wissocq (Editors)

livestock productivity and trypanotolerance. Network training manual

1983.198 pages. Paperback. 29.5 x 21 cm. ISBN 92-9053-0294 (E) and ISBN 92-9053-054-5 (F). Also available on microfiche: ISBN 92-9053-146-0 (E) and ISBN 92-9053-201-7 (F). Free.

Describes the parameters and techniques which are used in data collection on animal health, tsetse, and animal productivity, and how relevant information is extracted, analysed and interpreted.

Available in English and French.

S.N.H. Putt, A.P.M. Shaw, A.J. Woods, L. Tyler and A.D. James

ILCA Manual 3. Veterinary epidemiology and economics in Africa. A manual for use in the design and appraisal of livestock health policy

1987.xvii + 130 pages. Paperback. 19.7 x 21 cm. ISBN 92-9053-076-6 (E) and ISBN 92-8053-083-9 (F). Also available on microfiche: ISBN 92-9053-147-9 (E) and ISBN 92-9053-202-5 (F). US\$22.00 (including airmail postage).

Describes some of the basic techniques involved in the planning, monitoring, and evaluation of livestock disease control programmes in Africa; and some of the tools and concepts which enable disease problems to be identified and tackled in ways that make the most efficient use of available resources.

Available in English and French.

Frank O'Mahony

ILCA Manual 4. Rural dairy technology: Experiences in Ethiopia

1988. xi + 64 pages. Paperback. 19.7 x 21.5cm. ISBN92-9053-092-8. Also available on microfiche: ISBN 92-9053-148-7. US\$ 13.00 (including airmail postage).

This manual is intended as a teaching aid for extension-level technicians, and most of the information is presented in a practical "recipe" form. The techniques described are aimed at individual smallholders or small-producer cooperatives. Although based on experiences in

Ethiopia, the information and techniques should be useful to dairy technologists and extension workers in other parts of Africa.

Available in English.

Periodicals

ILCA Newsletter

Quarterly. 8-12 pages. Not bound. 28 x 21 cm. ISSN 0255-0024 (E) and ISSN 0255-0032 (F). Free.

Describes ILCAs research and collaboration with national agricultural research systems, along with news of workshops and conferences, all in the context of African livestock research and development.

Available in English and French.

ILCA Bulletin

Quarterly. 36-44 pages. Saddle stitched. 28 x 21 cm. ISSN 0255-0008 (E); ISSN 0255-0016 (F). Ceased publication in December 1989; last issue no. 35. Now available only on microfiche.

Contains scientific papers about ILCA's research written by staff scientists and their collaborators from national agricultural research systems.

Available in English and French.

African Livestock Research

Quarterly. Saddle stitched. 28 x 21 cm. Publishes articles in both English and French, with a summary in the other language. ISSN 1013-7750. First issue summer 1990.

Miscellaneous

ILCA's strategy and long-term plan

1987. iv + 99 pages. Paperback. 25.4 x 17.3cm. ISBN 92-9053-167-3 (E) and ISBN 98-9053-171 -1 (F). Also available on microfiche: ISBN 92-9053-168-1 (E) and ISBN 92-9053-214-9 (F). Free.

Outlines ILCA's strategy and plan, with special emphasis on the work plan for the next 5- to 10-year period. The strategy is unlikely to alter over the coming years, but the work plan will be subject to periodic review according to both ILCAs progress and impact, and the changes in priorities that are likely to evolve over time.

Available in English and French.

ILCA's strategy and long-term plan: A summary

1987. 25 pages. Saddle stitched. 24 x 17 cm. ISBN 92-9053-169-X (E) and ISBN 92-9053-172-X (F). Also available on microfiche: ISBN 92-9053-170-3 (E) and ISBN 92-9053-215-7 (F). Free.

Summary version of ILCA's Strategy and Long-term Plan.

Available in English and French.

Sustainable production from livestock in sub-Saharan Africa: ILCA's programme plans and funding requirements, 1989-1993

1988. vi + 93 pages. Paperback. 25.4 x 17.3. ISBN 92-9053-096-0. Also available on microfiche: ISBN 92-9053-149-5. Free.

Outlines the planning process which led to further refinements in the fundamental and strategic choices made in ILCA's Strategy and Long-Term Plan. Activities to be pursued during 1989-93 are summarised under a number of themes identified within the six research thrusts and the training and information programme.

Available in English.

Bibliographies

I. Haque, Desta Beyene and Marcas Sahlu

Bibliography on soils, fertilizers, plant nutrition and general agronomy in Ethiopia

1985. vii + 55 pages. Originally in paperback. 24 x 17 cm. ISBN 92-9053466-9. Now available only on microfiche: ISBN 92-9053-150-9. US\$ 15.00 (including airmail postage).

The first comprehensive bibliography of research on Ethiopian soils, fertilizers, plant nutrition and general agronomy. It is intended for use by researchers, development agents, planners and administrators.

Contains 853 citations.

M.H. Butterworth, Michael Hailu, Marcos Sahlu and Sirak Teklu

Beef cattle production from tropical pastures: A descriptive bibliography

1985. vi + 112 pages. Originally in paperback. 24 x 17 cm. ISBN 92-9053-057-X. Now available only on microfiche: ISBN 92-9053-151-7. US\$20.00 (including airmail postage).

Lists references to research work conducted on beef cattle production under different management systems in the tropics, with special reference to methods by which productivity may be increased. The references were drawn from Beef cattle nutrition and tropical pastures (Longmans, 1985) and from ILCAs data base. Contains 631 citations.

J.E. Sumberg

Gliricidia sepium (Jacq.) Steud: A selected bibliography

1986. vi + 12 pages. Saddle stitched. 17 x 24cm. ISBN 92-9053-061-8. Also available on microfiche: ISBN 92-9053-152-5. US\$ 4.00 (including airmail postage).

References to research work conducted on *Gliricidia* over the past decade are scattered in journals of several disciplines. This bibliography provides quick access to the biology, use and management of *Gliricidia* in the humid and subhumid tropics, with particular reference to its potential in intensified smallholder farming systems. Contains 143 citations.

P. Francis and Getachew Bulfeta

Land and tree tenure in humid West Africa: A bibliography

1987. v + 33 pages. Paperback. 24 x 17 cm. ISBN 92-9053-091-X. Also available on microfiche: ISBN 92-9053-1533. US\$6.00 (including airmail postage).

Land tenure rules regulate access to and use of land, control the distribution of its products, and provide the framework within which agricultural decisions are made. This bibliography covers tenure systems in countries in the humid zone of West Africa. A national, rather than a strictly ecological, approach reflects the focus of much of the literature, which frequently deals with entire countries. References are listed by author, subject, and geographical region. Contains 510 citations.

P.H. Starkey, Sirak Teklu and M.R. Goe

Animal traction: An annotated bibliographic database

1990. ??? pages. Paperback. 24 x 17cm. ISBN92-9053-103-7. Also available on microfiche: ISBN 92-9053-154-1. Also available in CDS/ISIS format on ISM-compatible personal computer diskette: ISBN 92-9053-106-1, [In press].

A comprehensive listing of annotated citations relating to research or application of animal traction throughout the world. It is divided into 18 subject categories, and includes descriptor, author and country indexes. Contains 1341 citations.

C. O'Connor and Marcos Sahlu

Production and processing of milk from cattle in sub-Saharan Africa: A bibliography

1990. vii + 102 pages. Paperback. 24 x 17 cm. ISBN 92-9053-102-9. Also available on microfiche: ISBN 92-9053-155-X. [In press].

A listing of the major writings on milk production and processing in sub-Saharan Africa. The references are indexed by author, subject and country to which they relate, and are drawn mainly from ILCA's in-house bibliographic database and from the databases of the Commonwealth Agricultural Bureaux International and the FAO agricultural information system, AGRIS. Contains 953 citations.

Amekalech Atlaw and Marcos Sahlu

ILCA in print

1989. viii + 235 pages. Paperback. 24 x 17 cm. ISBN 92-9053-104-5. Also available on microfiche: ISBN 92-9053-156-8. Free.

Lists all the major publications produced by ILCA staff since the Centre's inception in 1974. Contains 1749 citations classified under 17 disciplines and 26 subheadings. Includes subject and author indexes. Publications listed in the catalogue include articles published in refereed journals, monographs, technical papers, books, reports and dissertations.

ILCA in print - Supplement 1

1990. 33 pages. Saddle stitched. 24 x 17 cm. ISBN 92-9053-105-3. Also available on microfiche: ISBN 92-9053-157-6. Free.

The first supplement to ILCA in Print. It contains 136 citations of publications produced by ILCA staff, categorised by 14 disciplines and 24 subheadings, and indexed by author.

Microfiche Indexes

This series of catalogues lists non-conventional literature on livestock production selected and microfiched by ILCAs documentation team in various African countries. Each document has four indexes: bibliographic, subject, author and institution. These catalogues are free to any reader or library in Africa, and to libraries outside Africa. Individuals outside Africa should order at the listed price.

Catalogue des documents microfilmes par l'équipe CIPEA/CRDI; mission du Burundi

1982. vii + 20 pages. Agrafe a cheval. 28 x 21. ISBN 92-9053-014-6. Egalement disponible sous forme de microfiche: ISBN 92-9053-203-3. 127 references. 5 \$E.-U. (port avion inclus).

Catalogue des documents microfilmes par l'équipe CIPEA/CRDI; mission du Cameroun

1982. vii + 23 pages. Agrafe a cheval. 28 x 21. ISBN 92-9053-015-4. Egalement disponible sous forme de microfiche: ISBN 92-9053-204-1. 146 references. 5 \$E.-U. (port avion inclus).

Catalogue of documents microfiched by ILCA/IDRC team: Tanzania mission

1982.vii + 19 pages. Saddle stitched. 28 x 21 cm. ISBN92-9053-017-0. Also available on microfiche: ISBN 92-9053-158-4. 165 citations. US\$4.50 (including airmail postage).

index to livestock literature microfiched in Sudan

1982. ix + 107 pages. Paperback. 25 x 17. ISBN92-9053-018-9. Also available on microfiche: ISBN 92-9053-159-2. 532 citations. US\$ 11.00 (including airmail postage).

Index to livestock literature microfiched in Zambia

1982. ix + 22 pages. Saddlestitched. 24 x 17 cm. ISBN92-9053-024-3. Also available on microfiche: ISBN 92-9053-160-6. 169 citations. US\$5.00 (including airmail postage).

Index des documents microfiches au Zaire

1982. ix + 24 pages. Agrafe a cheval. 24 x 17. ISBN 92-9053-045-6. Egalement disponible sous forme de microfiche: ISBN 92-9053-205-X. 136 references. 5 \$E.-U. (port avion inclus).

Index to livestock literature microfiched in Ghana

1982. ix + 43 pages. Saddle stitched. 24 x 17 cm. ISBN 92-9053:033-2. Also available on microfiche: ISBN 92-9053-161-4. 297 citations. US\$6.50 (including airmail postage).

Index des documents microfiches au Senegal

1983. ix + 39 pages. Agrafe a cheval. 24 x 17. ISBN 92-9053-032-4. Egalement disponible sous forme de microfiche: ISBN 92-9053-206-8. 216 references. 6,50 \$E.-U. (port avion inclus).

Index des documents microfiches par l'equipe CIPEA/CRDI en Haute Volta

1983. xi + 26 pages. Agrafe a cheval. 24 x 17. ISBN 92-9053-051-0. Egalement disponible sous forme de microfiche: ISBN 92-9053-207-6. 183 references. 5,50 \$E.-U. (port avion inclus).

Index des documents microfiches par l'equipe CIPEA/CRDI en Cote d'Ivoire

1984. xi + 32 pages. Agrafe a cheval. 24 x 17. ISBN 92-9053-049-9. Egalement disponible sous forme de microfiche: ISBN 92-9053-208-4. 246 references. 6 \$E.-U. (port avion inclus).

Index des documents microfiches par l'equipe CIPEA/CRDI au Rwanda

1984. xi + 34 pages. Agrafe a cheval. 24 x 17. ISBN 92-9053-053-7. Egalement disponible sous forme de microfiche: ISBN 92-9053-209-2. 254 references. 6 \$E.-U. (port avion inclus).

Index to livestock literature microfiched by the ILCAI IORC team in Malawi

1984. xii + 72 pages. Saddle stitched. 24 x 17 cm. ISBN 92-9053-055-3. Also available on microfiche: ISBN 92-9053-162-2. 575 citations. US\$9.50 (including airmail postage).

Index to livestock literature microfiched in Botswana

1985. viii + 146 pages. Paperback. 24 x 17 cm. ISBN 92-9053-063-4. Also available on microfiche: ISBN 92-9053-163-0. 1013 citations. US\$ 16.00 (including airmail postage).

Index to livestock literature microfiched in Zimbabwe (Parts 1 and 2)

1986. viii + 235 pages. Paperback. 24 x 17 cm. ISBN 92-9053:064-2. Also available on microfiche: ISBN 92-9053-164-9. 1542 citations. US\$21.00 (including airmail postage).

Index des documents microfiches au Benin

1986. xi + 73 pages. Broche. 24 x 17. ISBN 92-9053-077-4. Egalement disponible sous forme de microfiche: ISBN 92-9053-210-6. 315 references. 9,50 \$E.U (port avion inclus).

Index des documents microfiches au Niger

1987. ix + 149 pages. Broche. 24 x 17. ISBN 92-9053-085-5. Egalement disponible sous forme de microfiche: ISBN 92-9053-211-4. 857 references. 16 \$E.-U. (port avion inclus).

Index des documents microfiches au Togo

1987. vi + 51 pages. Broche. 24 x 17. ISBN 92-9053-087-1. Egalement disponible sous forme de microfiche: ISBN 92-9053-212-2. 270 references. 7,50 \$E.-U. (port avion inclus).

Index to livestock literature microfiched in The Gambia

1987. vii + 41 pages. Paperback. 24 x 17 cm. ISBN 92-9053-088-X. Also available on microfiche: ISBN 92-9053-165-7. 230 Citations. US\$ 7.00 (including airmail postage).

Index to livestock literature microfiched in Kenya

1988. viii + 303 pages. Paperback. 24 x 17 cm. ISBN 92-9053-093-6. Also available on microfiche: ISBN 92-9053-166-5. 1794 citations. US\$20.00 (including airmail postage).

Index des documents microfiches a Madagascar

1988. viii + 81 pages. Agrafe a cheval. 24 x 17. ISBN 92-9053-097-9. Egalement disponible sous forme de microfiche: ISBN 92-9053-213-0. 689 references. 10.00 \$E.-U. (port avion inclus)

Distribution policy

The journal African Livestock Research is available to individuals on subscription, and is sent free to NARS libraries in Africa. Other libraries, in Africa and elsewhere, may receive the journal on an exchange basis, or on subscription. Details of subscription rates and exchange arrangements are available from the Editor of African Livestock Research at ILCA headquarters.

All other ILCA publications are available free to NARS scientists and NARS libraries in Africa, if ordered directly from ILCA headquarters in Ethiopia and sent to an African address. Libraries elsewhere can receive ILCA publications in exchange for their institute's publications. Other readers can buy publications from ILCA or from our North American or European distributors:

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Network publications

ILCA supports several African collaborative research networks working in subject areas closely related to ILCA's research thrusts. ILCAs involvement includes assistance with coordination of network activities, and with printing of network newsletters, conference proceedings and other publications.

Network publications are available from the coordinators at the addresses listed below.

African Livestock Policy analysis Network (ALPAN)

ALPAN Editor
Livestock Economics Division
ILCA
PO Box 5689
Addis Ababa
Ethiopia

African Research Network for Agricultural Byproducts (ARNAB)

ARNAB Coordinator
ILCA
PO Box 5689
Addis Ababa
Ethiopia

Pasture Network for Eastern and Southern Africa (PANESA)

PANESA Coordinator
ILCA
PO Box 46847
Nairobi
Kenya

Small Ruminant Network

Small Ruminant Network Coordinator
ILCA
PO Box 5689
Addis Ababa
Ethiopia

African Trypanotolerant Livestock Network

African Trypanotolerant Livestock Network Coordinator
ILCA
PO Box 46847
Nairobi
Kenya

West African Animal Traction Network

West African Animal Traction Network Coordinator
ILCA
PMB 2248
Kaduna
Nigeria

Cattle Research Network

Cattle Research Network Coordinator

ILCA

PO Box 5689

Addis Ababa

Ethiopia

ILRAD

**International Laboratory for Research on Animal
Diseases**

P.O. Box 30709
Nairobi, Kenya
Telex : 963-22040
Cable : ILRAD
E-Mail : 74:CGU005 ILRAD
Fax : (254-2) 593499

General Information

The International Laboratory for Research on animal Diseases (ILRAD) is a modern complex of veterinary research laboratories and support facilities on a 70-hectare site at Kebete, Kenya. ILRAD was established in 1973 with a mandate to conduct basic research leading towards the development of safe, effective and economically feasible measures to control livestock diseases which seriously limit world food production.

Scientists at ILRAD work in the fields of parasitology, immunology, biochemistry, cell and molecular biology, pathology, electron microscopy and socio-economics. Emphasis is on the development of vaccines, but other approaches to disease control are also investigated, such as the strategic use of chemotherapy and the enhancement of genetic resistance, often in collaboration with other organizations.

ILRAD also offers training to scientists, laboratory technicians and field personnel, and courses and conferences are held every year on topics related to ILRAD's research program.

Major research programs:

Current research programs focus on two livestock diseases of great economic importance in Africa and other developing regions: African trypanosomiasis and East Coast fever, a virulent form of theileriosis. Both are caused by protozoan parasites which are transmitted to livestock by arthropod vectors.

ANNUAL REPORTS

International Laboratory for Research on Animal Diseases

ILRAD 1988 Annual Report

103 pages. 17.5 x 25 cm. Saddle wired. Softcover. ISBN 92-9055-088-0. From 1981, both English and French editions published. (Other editions available: 1976, 1977, 1979-1987. From 1976-1980: about 50 pages, 20.5 x 29.5 cm, saddle wired. From 1981 : about 80 pages, 17.5 x 25 cm, saddle wired.) Free.

ILRAD's annual reports are intended for a wide range of readers, with emphasis on laboratory and field workers in Africa who are responsible for animal health. The annual reports summarize the year's research activities and results aimed at improving control measures for African animal trypanosomiasis and East Coast fever, a virulent form of theileriosis. Training and information activities are summa-

rized, and scientific articles and other publications published by ILRAD staff during the year are listed.

International Laboratory for Research on Animal Diseases

ILRAD 1989 Annual Scientific Report

121 pages. 17.5 x 25 cm. Perfect bound. Softcover. ISBN 92-9055-689-7. (Other editions available: 1987 and 1988.) Free.

ILRAD's annual scientific reports are intended for scientists and technicians who work in areas related to ILRAD's research program. The annual scientific reports comprise short statements on each research project conducted at the institute. The abstracts are written by the scientific and technical teams conducting the projects and outline experimental results obtained during the year.

RESEARCH HIGHLIGHTS

International Laboratory for Research on Animal Diseases

ILRAD 1989 Highlights

6 pages. 21 x 29.5 cm. Single fold with insert. ISBN 92-9055-390-1, (Annual; other editions available: 1986, 1987, 1988.) English and French editions published. Free.

ILRAD's Highlights are intended primarily for scientists and technicians who work in areas related to ILRAD's research program, as well as staff of the donor organizations that support ILRAD. The Highlights summarize the year's research results and training and cooperative research activities.

PERIODICALS

International Laboratory for Research on Animal Diseases

ILRAD Reports

Published quarterly from Jul 1983. 4-8 pages. 21 x 29. 5cm. Folded, English: ISSN 0255-4585; French: ISSN 0255-4593. English and French editions published. Free.

Each issue of this newsletter describes current work in one or two of ILRAD's research areas. Recent articles related to this work are listed, and ILRAD courses, workshops, and conferences are announced and described.

PUBLICATIONS LISTS

International Laboratory for Research on Animal Diseases

ILRAD Publications: 1975-1 985

1989.53 pages. 17.5 x 24.5 cm. Saddle wired. Softcover. ISBN 92-9055-589-0. Qree.

Results of the Laboratory's work from 1975 to 1985, published in over 500 publications, are listed. Most of the publications are papers in international scientific journals. The list is published to facilitate access to ILRAD's research results. Together with ILRAD's outreach and training programs, scientific publications are the vehicle with which the institute disseminates new knowledge and research results to scientists and policymakers in countries affected by African animal trypanosomiasis and East Coast fever.

International Laboratory for Research on Animal Diseases

ILRAD Publications

Annual, published for 1986 and 1987. 4 pages. 21 x 30 cm. Single fold. Free.

Annual updates of the publications by ILRAD staff listed in *ILRAD Publications: 1975.1985*.

Proceedings of Conferences, Workshops, and Symposia

J.B. Henson and Marilyn Campbell (Editors)

Theileriosis: Report of a Workshop

1977.112 pages. 17 x 24.5 cm. Perfect bound. Softcover. ISBN 0-88936-124-X. Published for ILRAD by the International Development Research Centre, Box 8500, Ottawa, Canada K1G3H9. ILRAD has a few copies of this volume to distribute free to LDC users. For bulk orders by surface mail, contact the publisher.

Report of a workshop on theileriosis, a tick-borne parasitic disease of animals occurring in Africa and the Middle East. Papers presented examine the effects of the disease on cattle production, available means of effective disease control, and incidence of infection in various species of bovidae.

International Laboratory for Research on Animal Diseases

**Inauguration Symposium on Current Trends
in immunology and Genetics and Their Implications
for Parasitic Diseases**

1979.87 pages. 21 x 27 cm. Perfect bound. Softcover. Free.

This volume comprises proceedings of a symposium held on the occasion of the inauguration of ILRAD on 7 April 1978. Topics in the book include the extent of bovine trypanosomiasis and East Coast fever, the structural and genetic basis of antibody specificity and complementarity, approaches to the development of improved vaccines, and keeping parasitic diseases in perspective.

A.D. Infin, M.P. Cunningham, A.S. Young (Editors)

**Advances in the Control of Theileriosis: Proceedings of
an international Conference Held at the International
Laboratory for Research on Animal Diseases,
in Nairobi, 9-13 February 1981**

1981.427 pages. 16.5 x 24.5cm. Smyth sewn. Hard cover. ISBN 90-247-2429-g. Free. Published for ILRAD, through the Commission of the European Communities, by Martinus Nijhoff Publishers. ILRAD has a few copies of this volume to distribute free to LDC users. For bulk orders by surface mail, contact the publisher.

These are the proceedings of a conference on topics related to improved control of theileriosis. Papers were presented on the epidemiology of theileriosis, manipulation of parasite material in vitro and the application of in vitro techniques to vaccination, tick control methods, progress in chemotherapeutic treatment for theileriosis, an appraisal of immunization methods against the disease, recent research results into the mechanisms controlling immune responses in the host, and the economics of theileriosis control.

AD. Irvin (Editor)

**immunization against Theileriosis in Africa:
Proceedings of a Workshop Held in Nairobi, Kenya,
1-5 October 1984**

1985.167 pages. 21 x 29 cm. Side wired. Softcover. ISBN 92-9055-258-9. Free.

These are the proceedings of a workshop sponsored jointly by ILRAD and the Food and Agriculture Organization of the United Nations. Participants from 11 countries affected by theileriosis met with invited specialists to discuss extension of an infection and treatment method

of immunization against East Coast fever. The prospects of similarly controlling related sub-Saharan theilerioses were also considered.

A.D. Irvin (Editor)

immunization against East Coast Fever: Report of a Workshop on Collection, Handling and Analysis of Performance and Productivity Data, Held in Nairobi, Kenya, 23-25 September 1985

1986.32 pages. 21 x 29 cm. Saddle wired, Softcover. ISBN 92-9055-286-7. Free.

These are the proceedings of a workshop on appropriate ways to collect, handle, and analyze data on the performance and productivity of cattle immunized against East Coast fever by an infection-and-treatment method.

W. Ivan Morrison (Editor)

The Ruminant immune System in Health and Disease

1986.580 pages. 16 x 23.5 cm. Smyth sewn. Soft cover. ISBN 0-521 - 32443-2. Free. Published for ILRAD by Cambridge University Press. ILRAD has copies of this volume to distribute free to LDC users. For bulk orders by surface mail, contact the publisher.

This volume presents the proceedings of a conference on The Application of Ruminant Immunology to the Control of Bovine Diseases, held in Nairobi, Kenya, in September 1983. The cellular components of the immune system are discussed first, including ontogeny, structural organization and how they interact during the generation of immune responses. This is followed by information on specific aspects of humoral and cell-mediated immune responses, and finally a section on the relevance of various types of immune responses in protection against a number of important infectious diseases in ruminants.

International Laboratory for Research on Animal Diseases

Parasite Antigens: Summary Proceedings of an international Workshop Held in Nairobi, Kenya, 13-17 May 1985

1986.52 pages. 21 x 29 cm. Saddle wired. Softcover. Free.

This book comprises summaries of presentations given at a workshop that reviewed the status of research aimed at identifying, characterizing, producing, and using parasite antigens that may stimulate high levels of immunity in the host. ILRAD scientists pre-

sented their work on antigenicity in trypanosomes and Theileria, while invited speakers presented findings on antigenicity in other parasites. New approaches to the diagnosis of parasitic diseases were also discussed.

International Laboratory for Research on Animal Diseases

**Genetic Exchange in Trypanosomes: Summary
Proceedings of an International Workshop Held in
Nairobi, Kenya, 6-8 October 1986**

1987.60 pages. 21 x 29 cm. Saddle wired. Softcover. ISBN 92-9055-287-5. Free.

This book comprises summaries of presentations given at a workshop on the mechanisms of natural genetic exchange in trypanosomes, their frequency in wild populations, and their significance in the epidemiology of trypanosomiasis. New results of research work on genetic exchange by sexual or other processes in trypanosomes and the processes of genetic exchange in other protozoa are reviewed.

A.J. Teale (Editor)

MHC Class II Genes and Products and Their Significance for Disease Research in Livestock Species

4988. 83 pages. 17.5 x 24.5 cm. Smyth sewn. Softcover. Free. Published for ILRAD, through International Society for Animal Blood Group Research, by Blackwell Scientific Publications. ILRAD has a few copies of this volume to distribute free to LDC users. For bulk orders by surface mail, contact the publisher.

This special supplement of Animal Genetics (Volume 19, Supplement 1) reviews what is known about the major histocompatibility complex class II regions in livestock species, what still needs to be researched in this area, the most efficient ways of conducting this research in light of similar research being conducted in human and laboratory animals, and what the rewards of this research are likely to be regarding ILRAD's search for genes associated with livestock resistance or susceptibility to diseases.

International Livestock Centre for Africa and International Laboratory for Research on Animal Diseases

**Livestock Production in Tsetse-Affected Areas of
Africa: Proceedings of a Meeting Held 23-27 November
1987, in Nairobi, Kenya**

1988.473 pages. 17.5 x 25 cm. Smyth sewn. Softcover. ISBN 92-90552882 English and French editions published. Free.

These are the proceedings of a meeting of the African Trypanotolerant Livestock Network in 1987. The papers review livestock production in tsetse-affected areas of Africa, collaborative research networks in developing countries, the role of tsetse in African animal trypanosomiasis, the epidemiology of trypanosomiasis in livestock in Africa, genetic and environmental influences on trypanotolerance, the production potential of trypanotolerant livestock, and the use of chemotherapy against animal trypanosomiasis.

T.T. Dolan (Editor)

**Theileriosis in Eastern, Central and Southern Africa:
Proceedings of a Conference on East Coast Fever
Immunization Held in Lilongwe, Malawi,
20-22 September 1988**

1989.208 pages. 17.5 x 25 cm. Smyth sewn. Softcover. ISBN 92-9055-289-f Free.

These are the proceedings of one in a series of workshops held to provide summaries and updates of research into *Theileria parva* infection of cattle and improved, cost-effective control methods to protect livestock against East Coast fever. The papers give data on the prevalence of East Coast fever in eastern, central, and southern Africa since the previous workshop in this series, held in 1985. They report on immunization trials using an infection-and-treatment method, paying particular attention to problems encountered in applying this method. Invited papers discuss the attitude of governments to immunization, the role of regional veterinary centers in East Coast fever control, tick control methods in use, parasite characterization, the epidemiology of East Coast fever (including carrier states and the role of wildlife), data handling and analysis (including the use of geographic information systems), and chemotherapeutic treatment for the disease. The proceedings end with recommendations on research coordination, laboratory safety measures, and parasite nomenclature.

J. Lonsdale-Eccles and J. Lenahan (Editors)

**Protein Traffic In Parasite and Mammalian Cells:
Proceedings of a Workshop Held at the international
Laboratory for Research on Animal Diseases In Nairobi,
Kenya, 29 August-1 September 1988**

1989.160 pages. 17.5 x 25 cm. Perfect bound. Softcover. ISBN 92-9055-290-5: Free.

These are the proceedings of a workshop that reviewed current research in protein traffic and catabolism, with particular reference to parasitic diseases. The topics covered include protein targeting,

protein assembly, protein degradation, endocytosis, and lysosomal activity.

A.S. Peregrine (Editor)

Chemotherapy for Trypanosomiasis: Proceedings of a Workshop Held in Nairobi, Kenya, 21 -24 August 1989

In press. --- pages. 17.5 x 25 cm. Smyth sewn. Softcover. ISBN 92-9055-291-3. Free.

These are the proceedings of a workshop hosted by ILRAD that reviewed current research on aspects of the therapeutics, biochemistry and molecular biology of pathogenic trypanosomes for their immediate and long-term contribution to the control of human and animal trypanosomiasis. The meeting also reviewed findings from research on Plasmodia, Leishmania and mammalian cells, particularly in the area of drug resistance, for their relevance and possible application to research programs on trypanosomiasis. Potential new drug-delivery systems are also reviewed for their possible contribution to trypanosomiasis control. An overview and summary of the workshop's deliberations and a synopsis of ILRAD's chemotherapy program are given.

MISCELLANEOUS BOOKS

International Livestock Centre for Africa and International Laboratory for Research on Animal Diseases

Livestock Production in Tsetse-Affected Areas in Africa: Programme and Abstracts

1987. 75 pages. 25 x 17.5 cm. Saddle wired. Softcover. Bilingual: English and French. Free.

The program and abstracts are given of a meeting of the African Trypanotolerant Livestock Network Livestock Production in Tsetse-Affected Areas of Africa held 23-27 November 1987, at which Network scientists presented results of work conducted in 1986 and 1987, and plans for further Network research were evaluated.

International Laboratory for Research on Animal Diseases

Meeting the Challenge of Livestock Diseases: ILRAD in the 1990s

1988. 51 pages. 17.5 x 25 cm. Saddle wired. Softcover. Free.

This outline of ILRAD's long-term plan for the years 1988 to 1997 defines strategic issues and their resource implications. It also

describes research progress to date, ILRAD's second external program review, and ideas formulated since that review.

J.W. Hansen and B.D. Perry

**The Epidemiology, Diagnosis and Control
of Gastro-intestinal Parasites of Ruminants in Africa:
A Handbook**

1989. 132 pages. 17.5 x 25 cm. Spiral bound. Softcover. ISBN 92-9055-700-1. Free.

This handbook presents procedures and techniques with which to identify, diagnose, survey, and control intestinal parasites of ruminants in sub-Saharan Africa. The type and level of parasitism in a herd or flock must be assessed before the significance of parasite infections can be determined and economical control measures recommended. The handbook is intended for wide use in African universities, national veterinary laboratories, and rural veterinary clinics. The epidemiology of gastro-intestinal parasites is reviewed, and procedures for diagnosing these parasites are given in a simple, cookbook style. Guidelines for the design and interpretation of field investigations and the principles of control based on the results of such investigations are presented.

ILRAD RESEARCH REPORTS

A.D. Irvin

**Report on a Mission to Evaluate East Coast Fever in
Zanzibar**

1984. 33 pages. 21 x 29.5 cm. Plastic spiral bound. Free.

This report is of a mission made to Zanzibar in November 1984 to assess the possibility of introducing on the island immunization against East Coast fever, a major constraint to cattle production in Zanzibar.

A.D. Irvin and S.P. Morzaria

**Report on a Mission to isolate *Theileria parva* in
Zanzibar and to Assess the Feasibility of Conducting
Pilot immunization Trials Against East Coast Fever**

1985. 12 pages. 21 x 29.5 cm. Plastic spiral bound. Free.

This report is of a mission made to Zanzibar in November 1985 to isolate and characterize local theilerial strains and to reappraise the possibilities of carrying out immunization trials on the island.

S.P. Morzaria, A.D. twin, and T.T. Dolan

Immunization Against East Coast Fever: Isolation and Characterization of *Theileria parva* Stocks from Unguja and Pemba for Use in Infection and Treatment

1986. 13 pages. 21 x 29.5 cm. Plastic spiral bound. Free.

This report describes the results of characterizing parasite stocks derived from four isolates made from ticks collected on Unguja and Pemba islands. All stabilates were infective for susceptible Cattle, producing East Coast fever reactions of various levels of severity.

B.D. Perry, A.W. Mukhebi, R.A.I. Norval, and J.C. Barrett

A Preliminary Assessment of Current and Alternative Tick and Tick-Borne Disease Control Strategies in Zimbabwe: Report to the Director of Veterinary Services

January 1990. 41 pages. 21 x 29.5 cm. Plastic spiral bound. Free.

This report reviews the occurrence of tick-borne diseases in Zimbabwe and the measures used for their control. The report proposes for consideration two alternative tick-borne disease control strategies that are potentially more sustainable in the long term than strategies in current use. Target cattle populations for each strategy are identified, and the likely consequences of implementing each strategy are estimated. Resources that would be expended to implement the strategies are costed and projected over a twenty-year period. The technical, epidemiological, production, policy, and land-use implications of the strategies are discussed, and six broad recommendations regarding further research are made.

BROCHURES

International Laboratory for Research on Animal Diseases

ILRAD: Questions and Answers

1987.4 pages. 21 x 10 cm. Single fold. English and Swahili versions published. Free.

This brochure, written for non-scientists, briefly describes the institute, its goals, and its research into improved control of trypanosomiasis and theileriosis.

International Laboratory for Research on Animal Diseases

Research Programs at ILRAD

1985 (French edition 1986). 10 pages. 21.5 x 10 cm. Concertina. English and French versions published. Free.

This brochure gives a brief description of ILRAD's facilities and research programs. Research is in the fields of parasitology, immunology, molecular biology, cell biology, biochemistry, and veterinary pathology. Emphasis is on the development of vaccines against theileriosis and African animal trypanosomiasis, but other control methods are considered, such as improving genetic resistance and the strategic use of drugs.

International Laboratory for Research on Animal Diseases

Training Opportunities at ILRAD

1982. 10 pages. 21.5 x 10 cm. Concertina. English and French versions published. Free.

This brochure gives a brief description of ILRAD's institutional history and research on trypanosomiasis and theileriosis. The training program is described in detail, with information for potential participants at the technical, post-graduate, and post-doctoral levels.

Audiovisual Materials

S.B. Westley

ILRAD: An Introduction

1986. 150 slides, 20 minutes. Available on loan to appropriate users.

This is a 20-minute slide-tape show produced for a general audience. It depicts the importance of livestock in Africa and the establishment and development of ILRAD. ILRAD's two target diseases—theileriosis and African animal trypanosomiasis—are described, and ILRAD's research approaches are outlined. Training and information activities are mentioned, and ILRAD's donors are listed.

IRRI

International Rice Research Institute

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General information

Rice is life itself to almost a third of the world's 4.5 billion people. The average annual income of rice consumers in the developing nations is less than US\$300.00. Rice is a secondary staple for another 450 million people.

Rising populations and the demand for more food put increasing burdens on the world's small-scale rice farmers.

The International Rice Research Institute (IRRI) has as its objective the improvement of the quality and quantity of rice. Established in 1960 by the Ford and the Rockefeller Foundations, this nonprofit organization is adjacent to the University of the Philippines at Los Baños, 65 km southeast of Manila.

Today, IRRI is funded through the Consultative Group for International Agricultural Research, a group of donor agencies dedicated to the improvement of agriculture in developing nations. IRRI scientists cooperate with scientists across the world to develop improved rice varieties and technology.

Since its inception, IRRI has stressed the communication of rice research and production technology through books, conference proceedings, periodicals, and other instructional materials.

Ordering instructions

Because the primary purpose of IRRI publications is to increase the flow of rice information in developing nations, *IRRI provides materials at a 70% discount in developing nations.*

Book dealers in both highly developed countries (HDCs) and less developed countries (LDCs) receive a 40% discount.

Prices and airmail and surface mail costs are included for HDCs and LDCs. Please add appropriate postage fee to the price of each book.

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2. Surface mail delivery to most destinations takes 5-6 months or longer.

For bulky orders, IRRI strongly advises customers to order via air freight. This refers to any order of 20 kg or more (the equivalent of 8 copies of the IRRI Annual Report, about 475 pages each; or 32 copies of Rice Improvement, 186 pages). For air freight shipments we charge the customer only actual air freight charges. We are not able to process sea freight orders.

Prepayment requirement

Enclose payment with your orders. Payment can be made by checks or money order in Philippine pesos or US dollars drawn on any US banks. Checks drawn on dollar accounts in US banks by a correspondent foreign bank in special check arrangements are also acceptable.

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Send orders with prepayment to:

Information Center
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1099 Manila, Philippines

Make checks payable to IRRI-Information Center.

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Basic sets

All major IRRI publications are available as Basic Sets.

Libraries or individuals in developing nations can purchase a Basic Set of all IRRI books and technical publications in stock (except bibliographies) for US\$500.00, excluding air freight. In highly developed countries the price is US\$1,160.00 plus air freight. A Basic Set is about 70 kg of publications.

Distributors

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Customers In North America can also order IRRI books from: Agri-bookstore, Winrock, 1611 North Kent St., Arlington, Virginia 22209, USA.

Customers in Europe may order from: Verlag Josef Margraf, TRIOPS, Tropical Scientific Books, Toeche-Mittler Distribution, Hindenburgstr 33, 6100 Darmstadt, Federal Republic of Germany.

Customers in Japan may order from: Publisher's International Corporation, 2nd Newfield Building, 423 Ohtsuka 3-Chome Bunkyo-ku, Tokyo 112, Japan.

Customers in Taiwan, China may order from: Harvest Farm Magazine, 14 Wenchow Street, Taipei, Taiwan, China.

Customers in India may order from: Oxford Book and Stationery Company, Scindia House, New Delhi 110001 and Haryana Scientific Corporation, Gandhi, Chowk, Hisar (Havana) 125001.

Prices are similar but postal rates are lower and delivery is faster.

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Customers in the Philippines can also purchase IRRI publications from:

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Urban II Bldg., Sen. Gil J. Puyat Avenue
1200 Makati, Metro Manila

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c/o Ms. Thelma Padero
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Research Highlights

International Rice Research Institute

IRRI Highlights 1988

1989.76 pages 17.7 x 22.8 cm. Paperback. ISSN 0115-1142. HDC \$13.30, LDC \$4.00 plus airmail (\$4.00) or surface mail (\$1.00) postage.

A yearly report on IRRI progress in areas such as rice breeding for resistance to diseases, insects, drought, adverse soils, and cold and hot temperature; pest control; irrigation water management; soil and crop management; cropping systems; machinery development; finances; and others. Illustrations in color.

IRRI Highlights 1988 focuses on IRRI programs to develop improved rice varieties and management practices for farmers in economically and environmentally disadvantaged areas—those bound to rainfed upland and lowland rice, or in areas of deep water or problem soils. Simultaneously, rice scientists must continue to develop, for farmers in more favored irrigated areas, low-cost technologies to permit them to reduce production costs without sacrificing yield gains.

Also available, Research Highlights for: 1980, 1981, 1982, 1983, 1984, 1985, 1986, and 1987.

Annual Reports

International Rice Research Institute

IRRI Annual Report for 1987

1988.640 pages. 17.7 x 25.4 cm. Paperback. ISSN 0116-4341. HDC \$38.30, LDC \$11.50 plus airmail (\$9.80) or surface mail (\$2.00) postage.

This is an in-depth annual report of IRRI's overall research progress presented on a problem area basis rather than by scientific discipline. Major sections include Genetic Evaluation and Utilization (problem-oriented plant breeding); Control of Diseases, Insects, and Weeds; Irrigation and Water Management; Soil and Crop Management; Environment and Its Influence; Consequences of New Technology; Rice-Based Cropping Systems; and Machinery Development.

Also available, IRRI Annual Report for: 1980, 1981, 1982, 1983, 1984, 1985, and 1986.

Monographs

D.L. Plucknett, N.J.H. Smith, J.T. Williams, and N. Murthi Anishetty
Gene Banks and the World's Food

1989.247 pages. 15.2 x 22.8 cm. Paperback. ISBN 971-104-207-X. HDC, send orders to Princeton University Press, 41 William St., Princeton, New Jersey 08540, USA. LDC \$5.00 plus airmail (\$6.00) or surface mail (\$2.00) postage.

Gene banks have arrived on the center stage of scientific and public-policy debates. Intense public interest in genetic engineering has raised expectations that biotechnology will unveil dramatic improvements in crop plants and domestic animals. While breakthroughs in genetic engineering are occurring with increasing speed, options for the future are being foreclosed by the erosion of one of the world's most important heritages, the genetic diversity of our crop plants and their wild relatives.

Gene Banks and the World's Food is targeted for a broad audience of interested citizens, policy makers, researchers in the agricultural and environmental sciences, as well as social scientists concerned with farming and rural development. The global approach of the book stresses the scientific linkages between developed nations and the Third World and their interdependence in the worldwide effort to boost agricultural production.

This book was made possible by a cooperative publishing venture of Princeton University Press and IRRRI.

F.W.T. Penning de Vries, D.M. Jansen, H.F.M. ten Berge, and A. Bakema

Simulation of Ecophysiological Processes of Growth In Several Annual Crops

1989.271 pages. 15.2 x 22.8 cm. Paperback. ISBN 971-104-215-0. HDC, send orders to Centre for Agricultural Publishing and Documentation (PUDOC), P.O. BOX4,6700AA Wageningen, Netherlands. LDC US\$7.00 plus airmail (\$8.00) or surface mail (US\$2.00) postage.

A crop's growth rate and yield depend on its properties, crop management, weather, soil, and other factors. Many of the important relations and interactions have been modelled and published. This book summarizes such factors and serves as a textbook for crop growth simulation courses. It covers key ecophysiological processes such as photosynthesis, respiration and partitioning, Water use, and water balance processes in soils with high water tables or with impeded drainage.

The book provides complete dynamic summary models to simulate these processes, plus additional formulations whenever interesting extensions for specific crops are appropriate.

Physiological data to characterize species are provided for more than 15 crop types from both tropical and temperate regions. Data to characterize about 20 different soil types are also included. The accuracy of weather data required is discussed.

The rice crop and its simulation is emphasized. All models are written in the simulation language CSMP, and can be run on PCS.

The text and models are supported by exercises (with answers) to stimulate readers to apply the concepts and models to their own problems.

IRRI has made a cooperative arrangement with PUDOC Publishing Co., Netherlands, to distribute paperback copies of the book in Third World countries.

Monographs

International Rice Research Institute

1987 International Deepwater Rice Workshop

1988. 633 pages. 15.2 x 22.8 cm. Paperback. ISBN 971-104-187-1. HDC \$30.00, LDC \$8.00 plus airmail (\$10.00) or surface mail (\$3.00) postage.

The International Deepwater Rice Workshop yielded a number of innovative ideas such as additional crops (sunflower, early-maturing rice, etc.) before, along with, or after deepwater rice; ratooning of deepwater rice; and use of rice herbage from the deepwater crop. Also discussed were methods for screening for ufra nematode and yellow stem borer; and methods for measuring the oxygen, carbon dioxide, and ethylene contents of floodwater. Basic research on varietal differences in internode elongation and its mechanism, physiology, genetics, and measurement were reported.

Socioeconomic issues confronting poor rice cultivators in deepwater rice areas, especially women, were discussed.

Although deepwater rice is traditionally a monocrop, many participants from deepwater rice areas expressed a desire to try different cropping patterns and rice herbage use in farmers' field. Grain yields have not been substantially raised, but land use efficiency is definitely increasing, and there is hope for greater productivity from deepwater ricelands.

This volume includes papers presented at the workshop.

P.M. Hirschhoff and N.G. Kotler, Editors

Completing the Food Chain

1989. 193 pages. 15.2 x 22.8 cm. Paperback. ISBN 971-104-209-6. HDC, send orders to Smithsonian Institution, Washington D.C. 20560, USA. LDC \$7.00 plus airmail (\$7.00) or surface mail (\$2.00) postage.

The 1988 World Food Prize, the second awarded, was presented to Dr. Robert F. Chandler, former director general of the International Rice Research Institute, in October 1988. A Colloquium on *Completing the Food Chain* was convened at the Smithsonian Institution in association with the Prize.

Completing the Food chain is the result of this international gathering of agricultural scientists, nutritionists, medical doctors, and food policy leaders from nine nations.

Highlights include an in-depth probe of regional food and agriculture issues in Asia, Africa, and Latin America. Contributors share insights and perspectives from a number of disciplines and professional vantage points, including biogenetics and biotechnology, physiology and public health, economics, rural development, and agricultural science.

In the search for solutions to contemporary food and agricultural problems, the essays explore the lessons of the agricultural "Green Revolution," and the new food and biogenetic technologies that will boost future food production.

A. Mujeeb-Kazi and L.A. Technical, technical editors

Review of Advances in Plant Biotechnology, 198588

1989.329 pages. 15.2 x 22.8 cm. Paperback. ISBN 968-6127-34-8. HDC US\$10.80, LDC US\$3.00 plus airmail (US\$7.00) or surface mail (US\$2.00) postage.

The book is the proceedings of the 2nd International Symposium on Genetic Manipulation in Crops, held at CIMMYT, 29-31 August 1988.

The first symposium, held in Beijing, China, in October 1984 reviewed genetic manipulation work through 1984. This book summarizes research achievements since then. It is the consensus of plant breeder, geneticists, and other biologists that biotechnology holds the most hope for rapid improvement of crop plants, and for the advances required to sustain yield increases demanded in the face of an expanding world population and shrinking land resources.

IRRI and Academia Sinica, cosponsors of the first symposium, are pleased that CIMMYT, renowned for its contributions to the improvement of wheat and maize, joined us in sponsoring the second symposium.

International Rice Research Institute

Bacterial Blight of Rice

1989.235 pages. 15.2 x 22.8 cm. Paperback. ISBN 971-104-188-X. HDC \$14.00, LDC \$4.00 plus airmail (\$7.00) or surface mail (2.00) postage.

Bacterial blight has been known for a century, but was formerly restricted to East Asia. Occurrence of the disease became widespread in South and Southeast Asia in the 1960s, when the first-yielding varieties were planted. Today, bacterial blight is a major constraint to rice production in irrigated, rainfed lowland, and deep-water rice. The disease has recently been reported in other continents; its appearance in the Americas and Africa has caused concern about both its transmission and its dissemination.

In collaboration with national rice research programs, IRRI started breeding for bacterial blight resistance about two decades ago. The effort has lowered the disease pressure significantly. Many of today's popular modern varieties are resistant to bacterial blight.

The International Workshop on Bacterial Blight of Rice was held 14-18 March 1988. It was cosponsored by the Administration Générale de la Coopération au Développement, Ministère des Affaires Etrangères, Belgium.

Bacterial Blight of Rice, the proceedings of that meeting, reviews the progress made in research on the disease, the information exchanged at the workshop, and the recommendations made by distinguished scientists.

International Rice Research Institute

Progress in Irrigated Rice Research

1989. 390 pages. 15.2 x 22.8 cm. Paperback. ISBN 971-104-184-7. HDC \$16.00, LDC \$4.25 plus airmail (\$6.00) or surface mail (\$2.00) postage.

Irrigated rice is the most widely practiced culture, covers the largest area, and produces the highest yields. The 50% of the world's ricelands that are irrigated produce more than 70% of the world's rice.

Papers in the volume focus on the global rice situation, physiological aspects of the yielding ability of irrigated rice, pest management, and nutrient and water management. Also included are papers on farming systems, farm machinery, postharvest management, and innovative breeding techniques made possible by recent progress in hybrid rice breeding and biotechnology.

Miscellaneous

International Rice Research Institute

Publications of the International Agricultural Research and Development Centers: 1989 edition

1989. 730 pages. 13 x 21 cm. Paperback. All nations, US\$10.00 plus airmail (US\$10.00) of surface mail (US\$3.00) postage.

IRRI has released a 1989 catalog of all publications and educational materials published by 22 international Agricultural Research Centers: Publications of the International Agricultural Research and Development Centers.

The 730-page catalog is probably the world's largest compilation of titles on agricultural science for development.

Included is a 182-page keyword index to help the reader locate all publication in certain fields (i.e. cytogenetics, insect resistance, maize).

IRRI published the catalog on behalf of all Centers, and is handling its distribution.

Periodicals

International Rice Research Institute

IRRI Research Paper Series (IRPS)

Number of pages varies. 21.5 x 27.9 cm. Saddle stitched. ISSN 0115-3862.

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General Information

The International Service for National Agricultural Research (ISNAR) began operating at its headquarters in The Hague, Netherlands, on September 1, 1980. It was established by the Consultative Group on International Agricultural Research (CGIAR), on the basis of recommendations from an international taskforce, for the purpose of assisting governments of developing countries to strengthen their agricultural research. It is a non-profit autonomous agency, international in character, and non-political in management, staffing and operations.

Of the 13 centers in the CGIAR network, ISNAR is the only one that focuses primarily on national agricultural research issues. It provides advice to governments, upon request, on research policy, organization and management issues, thus complementing the activities of other assistance agencies.

ISNAR has active advisory service, research and training programs.

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- R22s. La Respuesta del INIPA a la Demanda de Investigación y Extensión Agropecuaria en el Perú. Julio 1985. (Agotado).
- La Respuesta del INIPA a la Demanda de Investigación y Extensión Agropecuaria en el Perú. Resumen Ejecutivo. Julio de 1985.
- INIPA's Response to Peru's Needs for Agricultural Research and Extension. Executive Summary. July 1985.
- Translation of the Spanish original.
- R23e. Regional Research Networks: the Experience of PRECODEPA. CIP, ISNAR. November 1985. (Out of print).
- Analysis, Evaluation, and Proposals for Strengthening CARDI's Regional Capacity. August 1985.
- R25e. Human Resources Planning and Management in the Instituto Nacional de Tecnología Agropecuaria of Argentina. January 1986.
- R29s. Fortalecimiento del Sistema de Investigación Agropecuaria y Transferencia de Tecnología. Report to the Government of Costa Rica. February 1988. (Agotado).
- R30s. El Modelo de Investigación, Extensión y Educación en el Perú: Estudio de un caso. Volúmenes I, II, III & IV. Octubre 1987.
- R31s. Las Relaciones entre la Investigación Agropecuaria y la Transferencia de Tecnología: El Caso de Chile. Mayo 1988.
- R40e. The Decentralization Process in the Instituto Nacional de Tecnología Agropecuaria. May 1989. Argentina Report.
- R43s. Reforzamiento del Instituto Nacional de Investigaciones Agropecuarias: Base para un Sistema Nacional de Investigación Agropecuaria. October 1989.
- R45s. Fortalecimiento del Sistema de Investigación y Transferencia de Tecnología Agropecuaria en Bolivia. October 1989.

WARDA

West Africa Rice Development Association

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Cote d'Ivoire

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Cable : ADRAO Bouake CI

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General Information

The West Africa Rice Development Association which was formed in September 1970 under the auspices of UNDP, FAO, and ECA is an intergovernmental organization consisting of 16 member countries namely: Benin, Burkina Faso, Chad, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

The Headquarters of WARDA are located in Bouake (Cote d'Ivoire) while its three Regional Research Stations are located at Mbe Valley, near Bouake, Cote d'Ivoire (Upland/Inland Swamp Continuum Program); Rokupr, Sierra Leone (Mangrove Swamp Rice Program), Saint-Louise, Senegal (Sahel Program Rice). In addition, WARDA has a research sub-station at Suakoko and a Regional Training Center at Fendall (Liberia).

WARDA is one of the 13 International Agricultural Research Centers (IARCs) of the Consultative Group on International Agricultural Research (CGIAR). The Association has been mandated to conduct and promote rice research to improve the technical and economic options available to smallholder farm families in West Africa.

Research Highlights

West Africa Rice Development Association

Highlights 1988-89: WARDA in Transition

1989. 24 pages. 21.5 x 28 cm. Saddle stitched.

A yearly report on WARDA recent progress and findings in all areas of research, training, and communications activities.

WARDA 1988-89 Highlights focuses on activities and processes that WARDA has undertaken in its last transition period year towards its restructuring.

Also available, WARDA Highlights for: 1985, 1986, and 1987. WARDA Highlights are also available in French.

Annual Reports

West Africa Rice Development Association

WARDA 1988 Annual Report

1989. 48 pages. 21.5 x 28 cm. Saddle stitched.

This publication gives an in-depth annual report of WARDA's Departments and Divisions activities progress.

Also available in French.

Monographs

Nyanleng, V.K.

Rice in West Africa: Consumption, Imports, and Production with Projections to the year 2000

1987, 443 p. 16 x 22.2 cm. Saddle stitched.

In this publication the rice situation in West Africa is analyzed in terms of consumption, imports and production, and projections of these up to the year 2000.

Although West African rice production is expected to continue to increase, per capita consumption in the 1990's is likely to drop by about 20% based on import reduction targets and other factors, notably foreign exchange availability, which are likely to constrain commercial imports.

West Africa Rice Development Association

A decade of Mangrove Swamp Rice Research

1988. 19 x 27.4 cm. Saddle stitched.

This publication marks the tenth anniversary of the WARDA Mangrove Swamp Rice Research Program that was established in 1977 at Rokupr, Sierra Leone. It highlights the efforts to tailor research on physical and biological problems to the difficult social and economic conditions of mangrove swamp rice farmers. It gives a summary of WARDA's achievements and contribution in this particular rice growing environment.

Miscellaneous

West Africa Rice Development Association

WARDA's Strategic Plan: 1990-2000

1988. 17 x 23.8 cm. Saddle stitched.

WARDA's strategy for the period 1990-2000 in response to the rice production needs of West Africa is outlined in this document WARDA's

goal, its operational mandate and other structural elements of the strategy are defined.

Also available in French.

West Africa Rice Development Association

WARDA's Medium-Term Implementation Plan 1990-1994

1989.20.2 x 25.4 cm. Paperback.

This plan provides the orientation, operational content, time frame and the resources required to implement the first phase of WARDAs Strategic Plan, 1990-2000.

Also available in French.

Periodicals

West Africa Rice Development Association

WARDA Occasional Papers

Number of pages varies. 28 x 21.5 cm. Stapled or wrap around.

The WARDA Occasional Papers reports research and other findings by WARDA staff members and their collaborators. Emphasis is on technical, social, and economics aspects of rice production, trade, and consumption in West Africa. Articles of more than journal article length are preferred and are published in the two official languages of WARDA, i.e. English and French.

- No. 7 V.K. Nyanteng.
Riceland in West Africa: Distribution, Growth and Limiting Factors. II, 23 p. July 1986.
- No. 8 V.K. Nyanteng, M. Samake; and S. Longabough
Socio-Economic Study of Rice Farming in Mali: The Household, Farm, Labour Characteristics, and Constraints III, 48 p. July 1986.
- No. 9 V.K. Nyanteng
Aspects of Rice Production, Marketing, and Pricing in Burkina Faso. IV, 66 p. November 1986.

No. 10 V.K. Nyanteng

An Overview of Rice Related Policies and Developments
in Nigeria. V, 52 p. November 1986.

Also available No. 1-6.

AVRDC

**Asian Vegetable Research and Development
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About AVRDC

The Asian Vegetable Research and Development Center (AVRDC) is an international center mandated for research and development of vegetable crops in the humid and subhumid tropics. Established in 1971, its activities include: germplasm collection, storage, and enhancement; varietal improvement; production technology improvement; environmental nutritional studies; technology transfer; training for national program personnel; and scientific publishing.

AVRDC works intensively to improve Chinese cabbage, mungbean, pepper (sweet and hot), soybean, sweet potato, and tomato for growing under tropical conditions. It also works with an additional 50 vegetables in its Production Systems Program.

How to Order

All of the publications listed below can be ordered from the Office of Information Services (OIS), AVRDC. The following list of distributors in the highly-developed countries (HDC) and less-developed countries (LDC) have many of these publications available for sale in local currency.

The prices quoted below include surface postage. If airmail delivery is required the additional postal charges will be added to the invoice. All charges should be paid with a US dollar check (payable by a bank in the USA) made out to AVRDC, or with Unesco coupons.

HDC Distributors

TRIOPS: Tropical
Scientific Books
Raiffeisenstr. 24
D - 60780 Longen
Fed. Rep. of Germany
(Orders for Europe)

Publishers Intl Corp.
2nd Floor, Newfield Bldg
42-3 Ontsuka 3-chome
Bunkyo-ku, Tokyo 112
Japan

LDC Distributors

World Universities Press
B-5/132, Safdarjung Enclave
New Delhi - 110 029
India

CGPRT Centre
Publications Section
Jalan Merdeka 99
Bogor 16111
Indonesia

Agribookstore
1161 N. Kent Street
Suite 600
Arlington, VA 22209
USA
(orders for North America)

University of Malaya
Coop. Bookshop, Ltd.
P. O. Box 1127
Jalan Pantai Baru, 59.700
Kuala Lumpur, Malaysia

INFO-LINE
GPO Box 506
Sydney, N.S.W. 2001
Australia
(Orders for Oceania)

INDEX, Book Promotion &
Service, Ltd.
Ploenchit Road, Pathumwan
Bangkok 10500, Thailand

Research Highlights

AVROC Progress Report Summaries provide a brief summary of all major activities as well as considerable institutional information about AVRDC. All issues cost HDC \$7.50; LDC \$4.00.

AVRDC Progress Report Summaries 1987

1988. 98 pages. 17.5 x 25.5 cm. Softcover. Perfect bound. ISSN 0258-3079.

AVRDC Progress Report Summaries 1988

1989. 100 pages. 17.5 x 25.5 cm. Softcover. Perfect bound. ISSN 0258-3079.

AVRDC Progress Report Summaries 1989

1990. 108 pages. 17.5 x 25.5 cm. Softcover. Perfect bound. ISSN 0258-3079.

Annual Reports

AVRDC Progress Reports provide detailed descriptions of all major activities as well as considerable institutional information about AVRDC. All issues of Progress Reports cost HDC \$20.00; LDC \$15.00.

AVRDC Progress Report 1985

1987.471 pages. 19 x 26 cm. Softcover. Perfect bound. ISSN 0258-3089.

AVRDC Progress Report 1986

1988.541 pages. 19 x 26 cm. Softcover. Perfect bound. ISSN 0258-3089.

AVRDC Progress Report 1987

1990.480 pages. 19 x 26 cm. Softcover. Perfect bound. ISSN 0258-3089.

Technical Bulletins

R.T. Opena, C.G. Kuo and J.Y. Yoon

Breeding and Seed Production of Chinese Cabbage in the Tropics and Subtropics

TB 17. 1988. 92 pages. 17.8 x 25.5 cm. Softcover. Perfect bound. HDC \$7.50; LDC \$4.00. ISBN 92-9058-0024-3.

This bulletin reports on the methods for breeding and seed production of this important temperate vegetable in tropical and subtropical areas where it is becoming increasingly popular.

International Guide Sheets

87-272 Jin-Young Yoon, Romeo T. Opeña, and Lien-chung Chang. 1987. Cultural Practices for Chinese Cabbage at AVRDC. 6 pages. 26 x 20.7 cm. (Gratis).

88-292 Talekar, N.S. 1988. How to Control Sweet potato Weevil: A practical IPM approach. 6 pages. 26 x 20.7 cm. (Gratis).

Conference, Symposia and Workshop Proceedings

Norma V. Llemit and Pura J. Lastimososa (editors)

Gardening Nutritious Vegetables: Proceedings of the Vegetable improvement Gardening Workshop

1987. 136 pages. 17.5 x 22.5 cm. Softcover. Perfect bound. HDC \$8.50; LDC \$4.50. ISBN 92-9058-028-3.

This collection of 14 different contributions given at the Vegetable Improvement Program Gardening Workshop examines the experiences of vegetable gardening at AVRDC, in Indonesia, the Philippines, and Thailand.

S. Shanmugasundaram and B. T. McLean (editors)

Mungbean, Proceedings of the Second International Symposium

1988. 750 pages. Softcover. Perfect bound. HDC \$40.00; LDC \$25.00. ISBN 92-9058-035-6.

This state of the art volume on mungbean includes theca. 90 papers given at the Second International Symposium on Mungbean held in Bangkok in 1987. Every aspect of this important legume is discussed.

Green, S.K, T.D. Griggs and B.T. Mclean (editors)

Tomato and Pepper Production in the Tropics

1989. 600 pages. Softcover. Perfect bound. HDC \$35.00; LDC \$22,50. ISBN 92-9058-037-2.

This volume contains 60 papers that deal with genetic resources and conservation, varietal improvement, stress physiology, disease and pests, integrated pest management and cultural management of tomato and pepper.

McLean, B.T.

Vegetable Research In Southeast Asia

1988. 242 pages. Softcover. Perfect bound. HDC \$17.50; LDC \$10.00. ISBN 92-9058434-8.

This volume contains papers that expound the successful vegetable industries in Taiwan and Korea, AVRDC past achievements and future role, the seed industry, the export potential to Japan for vegetables from Southeast Asia.

Bibliographies

AVRDC

Disease and Insect Pests of Mungbean and Black Gram: A Bibliography

1988. 257 pages. 18 x 25.5 cm. Softcover. Perfect bound. HDC \$17.50; LDC \$10.00. ISBN 92-9058-030-5.

This annotated bibliography with abstracts contains ca. 850 citations of the literature on mungbean pests and diseases. Paper copies of all entries are available from the AVRDC Library and Documentation Service.

Periodicals

TVIS News

Approx. 26 pages/issue. 21 x 27.5 cm. Perfect bound. HDC \$4.00; LDC \$2.00/issue. ISSN 0258-3119.

This journal is prepared by the Tropical Vegetable Information Service (TVIS) through AVRDC and published twice a year. It provides a platform of exchange of information for scientists working with mungbean, soybean, and Chinese cabbage.

Soybean Rust Newsletter

1989 February. 22 pages. Volume 9. 21 x 27.5 cm. Saddle stitched. HDC \$5.00; LDC \$2.00/issue. ISSN 0258-3097.

The newsletter provides research articles on this serious soybean disease.

CENTERPOINT

Approx. 8 pages/issue. 21.5 x 27.5 cm. Gratis.

This newsletter provides up-to-date information on AVRDC's activities on research, training, publications, etc.

ICLARM

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Introduction

The International Center for Living Aquatic Resources Management (ICLARM) is an autonomous, nonprofit, international scientific and technical center which has been organized to conduct, stimulate and accelerate research on all aspects of fisheries and other living aquatic resources.

The Center was incorporated in Manila on 20 January 1977 and its operational base was established in Manila in March 1977. The interests of ICLARM are primarily on tropical developing countries worldwide.

ICLARM is an operational organization, not a granting or funding entity. Its program of work is aimed to resolve critical technical and socioeconomic constraints to increased production, improved resource management and equitable distribution of benefits in economically developing countries. It pursues these objectives in the fields of aquaculture, capture fisheries management, and coastal resources management, including research, training and information activities with institutions in developing and developed countries.

The ICLARM core staff consists of internationally recruited scientists drawn from diverse disciplines in the biological, agricultural and social sciences. In addition, provision is made for interns, consultants and visiting fellows, contributing to breadth of competence and flexibility.

The core program and core staff are supported by a number of foundations and governments.

Objectives

The objectives of ICLARM as stated in its Articles of Incorporation may be summarized as follows:

To conduct and assist with research on fish production, management, presentation, distribution and utilization to assist peoples of the world in meeting their nutritional and economic needs.

To improve the efficiency of culture and capture fisheries through coordinated research, education and training, linked with appropriate development and extension programs.

To upgrade the social, economic and nutritional status of people in less-developed areas, through improvement of small-scale fisheries

To encourage labor-intensive and low-energy input systems where appropriate.

To publish and disseminate research findings in support of the Center's objectives.

To organize and conduct conferences, forums and workshops for discussion of current problems and for exchange of research results.

Annual Reports

J.L. Maclean and L.B. Dizon (Editors)

ICLARM Report 1987

1988. 110 pages. 18 x 25.5 cm. Perfect. ISSN 0115-4494, ISBN 971-1022-43-5. Available free on request by surface mail. US\$6.00 airmail.

J.L. Maclean and L.B. Dizon (Editors)

ICLARM Report 1988

1989. 126 pages. 18 x 25.5 cm. Perfect. ISSN 0115-4494, ISBN 971-1022-55-9, Available free on request by surface mail. US\$6.00 airmail.

Monographs

P. Edwards, R.S.V. Pullin and J.A. Gartner

Research and Education for the Development of Integrated Crop-Livestock-Fish Farming Systems in the Tropics

1988. 53 pages. 28 x 21.5 cm. Saddle-stitched. ISSN 0115-4389, ISBN 971-1022-46-X. US\$4.50 surface or US\$7.50 airmail.

There is a vast potential for Asia's numerous and needy small-scale farmers to enjoy the benefits of integration of aquaculture into farming systems. This publication attempts to create a framework for an interdisciplinary approach to research and education in integrated farming - a fusion of agriculture and aquaculture sciences.

J.M. Vakily

The Biology and Culture of Mussels of the Genus *Perna*

1989. 63 pages. 28 x 21.5 cm. Saddle-stitched. ISSN 0115-4389, ISBN 971-1022-70-2. US\$4.50 surface or US\$7.50 airmail.

This review covers the biology and ecology of the three genera of *Perna*: *P. viridis*, *P. canaliculatus* and *P. perna*. An overview is given of the technological status of culture systems with emphasis being laid on the description of advanced culture techniques such as raft and longline systems. Postharvest handling aspects for preservation of live and processed mussels are presented in detail and public health and economic aspects of the mussel culture industry are described.

M.L. Cuenco

Aquaculture Systems Modeling: An introduction with Emphasis on Warmwater Aquaculture

1989. 46 pages. 28 x 21.5 cm. Saddle-stitched. ISSN 0115-4389, ISBN 971-1 022-77-X. US\$3.75 surface or US\$6.50 airmail.

An introduction to modeling is presented. The basic concepts of systems and models and various types of models and their use in research and in management are described. Guidelines for modeling aquaculture systems are presented: empirical models for the analysis of multivariate datasets and theoretical models based on knowledge of the processes underlying a system. Steps in model development are discussed. Criteria for classifying and evaluating aquaculture models presented in the literature have been developed. Biological, engineering and economic aquaculture models are discussed. A broad review of their features is given. Examples of two modeling approaches to the production of Nile tilapia (*Oreochromis niloticus*) in rice fields are given in an appendix.

Conferences, Symposia and Workshop Proceedings

R.S.V. Pullin, T. Bhukaswan, K. Tonguthai and J.L. Maclean (Editors)

The Second international Symposium on Tilapia in Aquaculture

1988. 623 pages. 18 x 25.5 cm. Perfect (paper) Smythe-sewn (cloth). ISSN 115-4435, ISBN 971-1022-583 (paper), ISBN 971-1022-60-5 (cloth). US\$37.50 surface or US\$6.25 airmail (paper), US\$50.00 surface or US\$72.50 airmail (cloth).

Proceedings of the symposium held in Bangkok, Thailand, 16-20 March 1987, by tilapia scientists to discuss strategies for future research and development in the tilapia industry worldwide. Contains 82 full papers, 17 poster abstracts and author and species indexes.

The full papers were presented under seven sessions: culture systems, management and production; pathology; genetics and reproduction; nutrition; physiology; biology and ecology; and economics and socioeconomics.

R.S.V. Pullin (Editor)

Tilapia Genetic Resources in Aquaculture

1988.18 x 25.5 cm. Perfect. ISSN 01 15-4435, ISBN 971-1022-443. US\$6.00 surface or US\$9.50 airmail.

Tilapia culture in Asia and other nonAfrican countries is based on a narrow genetic base. In contrast, African countries, many of which need assistance to develop their own aquaculture sectors, hold the global wealth of tilapia genetic resources. These resources have yet to be tapped to improve cultured breeds.

These proceedings document a 1987 workshop held in Bangkok, Thailand, to discuss the documentation, conservation and utilization of tilapia genetic resources and their future use in aquaculture.

French edition (translated by Catherine Lhomme-Binudin) available at the same price.

G. Silvestre, E. Miclat and T.E. Chua

Towards Sustainable Development of the Coastal Resources of Lingayen Gulf, Philippines

1989.200p. 18 x 25.5cm. Perfect. ISSN 0115-4435, ISBN 971-1022-45-1. US\$11.25 surface or US\$18.75 airmail.

Proceedings of an ASEAN/US Coastal Resources Management Project workshop held in Bauang, La Union, Philippines, 25-27 May 1988. Contains 17 full papers, four group reports and recommendations, as well as a summary of plenary session discussions. The papers were presented in three sessions: coastal resources utilization; habitat restoration/enhancement and alternative livelihood; and socioeconomic, cultural and legal/institutional framework.

D. Pauly, P. Muck, J. Mendo and I. Tsukayama (Editors)

The Peruvian Upwelling Ecosystem: Dynamics and Interactions

1989.438 p. 28 x 21.5 cm. Perfect. ISSN 0115-4435, ISBN 971 -1022-47-8. US\$18.75 surface or US\$33.75 airmail.

Proceedings of the Workshop on Models for Yield Prediction in the Peruvian Ecosystem, 24-28 August 1987, Callao, Peru. A follow-up volume to *The Peruvian Anchoveta and Its Upwelling Ecosystem: Three Decades of Change*. Presents detailed analysis by an international group of authors of numerous time series of key physical and biological parameters of one of the most productive ecosystems in the world. These (monthly) time series include temperature (various areas off Peru), wind velocity and derived statistics (stress, upwelling, transport), new primary production, biomass and related statistics (numbers, food consumption) of various vertebrates including two species of sea birds, two of sea mammals and five species of fishes (including the all-important anchoveta, for which an extensive biological and bibliographic database is presented). The fishery and its management are documented and an alternative management scheme is proposed.

T.E. Chua and D. Pauly (Editors)

Coastal Area Management in Southeast Asia: Policies, Management Strategies and Case Studies

1989.254 pages. 18 x 25.5cm. Perfect. ISSN 0115-4435, ISBN 971-1022-61-3. U8\$11.25 surface or US\$18.75 airmail.

Proceedings of the ASEAN/US Policy Workshop on Coastal Area Management, in Johore Bahru, Malaysia, 25-27 October 1988. Contains two plenary papers and 25 full papers in seven sessions: sectoral management of coastal resources and coastal development - policy problems and issues, case studies, coastal area management for sustainable development, tools for coastal area planning and management, legal and institutional framework in coastal area management, transfer of coastal resources management experience and summary and recommendations.

T.E. Chua and A. White (Editors)

Policy Recommendations for Coastal Area Management in the Asean Region

1989.10 pages. 14 x 21.5 cm. Saddle-stitched. ISBN 971-1022-62-1. Free upon request by surface mail.

Presents a model for effective coastal area management as recommended by policymakers, administrators and scientists during the Policy Workshop on Coastal Area Management held at Johore Bahru, Malaysia, on 25-27 October 1988.

G.M. Hallegraeff and J.L. Maclean (Editors)

Biology, Epidemiology and Management of Pyrodinium Red Tides

1989. 286 pages. 15.5 x 23 cm. Perfect. ISSN 0115-4435, ISBN 971-1022-64-8. US\$35.00 surface or US\$56.25 airmail.

Proceedings of a workshop on 23-30 May 1989, in Bandar Seri Begawan, Brunei Darussalam, the first of its kind on a single species of red tide organisms, that brought together the scattered records of occurrences, biology, epidemiology, economics and management and discussed what could be done to contain the problem. The book includes all the presented reviews, discussions, original research articles and syntheses that came from the workshop plus an 80-page manual on identification, field methodology, laboratory techniques and epidemiology.

The Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development

Baguio Resolution on Coastal Resources Management

1990. 11 pages. 14 x 21.5 cm. Saddle-stitched. ISBN 971-1022-81-8, Free upon request by surface mail.

In a conference on "Managing ASEAN's Coastal Resources for Sustainable Development", held in Manila and Baguio City, Philippines, on 4 to 7 March 1990, sponsored by ICLARM and the Government of the Philippines, participants from the six ASEAN member countries agreed to state both collectively and unequivocally the importance of focusing international attention on the plight and protection of ASEAN's coastal resources. The result of the agreement is the Baguio Resolution.

Miscellaneous

Technical Reports

E.W. McCoy and T. Chongpeepien (Editors)

Bivalve Mollusc Culture Research In Thailand

1988. 182 pages. 28 x 21.5 cm. Perfect. ISSN 0115-5547, ISBN 971-102243-5. US\$9.00 surface or US\$16.00 airmail.

An account of a research conducted under the project Technical Assistance for Applied Research on Coastal Aquaculture, which

explored new biological and socioeconomic perspectives on bivalve mollusc culture to increase production and to improve the livelihood of farmers.

J.N. Paw, S. Bunpapong, A. White and M.S.M. Sadorra (Editors)

The Coastal Environmental Profile of Ban Don Bay and Phangnga Bay, Thailand

1988.86 pages. 28 x 21.5 cm. Perfect. ISSN 0115-5547, ISBN 971-1022-404 US\$1.25 surface or US\$6.50 airmail.

An in-depth profile of the two important bays in Thailand to help the coastal resource management planning. Information on the physical setting, natural and human resources, economic conditions and institutional framework, as well as existing constraints to effective management are included. The plans are to serve as guide in pursuing the two areas' optimum development.

L.S. Chia, K. Habibullah and L.M. Chou

The Coastal Environmental Profile of Singapore

1988.92 pages. 28 x 21.5 cm. Perfect. ISSN 01 155547, ISBN 971-1022-48-6 US\$1.25 surface or US\$6.50 airmail.

Intended for policymakers and researchers, these profiles provide information; describe coastal changes and suggest factors that may have brought about such changes; raise issues on coastal area management; and help formulate a coastal area management plan.

A. White, P. Martosubroto and M.S.M. Sadorra

The Coastal Environmental Profile of Segara Anakan-Cilacap, South Java, Indonesia

1989.82 a es. 28 x 21.5 cm. Perfect. ISSN 01 155547, ISBN 971-1022-54-0 US\$1.25 surface or US\$6.50 airmail.

A profile of the coastal environment of Indonesia, which has the second largest coastline in the world, particularly on the unique ecological features of Segara Anakan-Cilacap. It presents the potentials for aquaculture development as well as the problems and the proposed solutions.

J.L. Maclean, R.M. Temprosa, N.I. Jhocson and A.F. Diaz

The Bibliographic impact of ICLARM

1990. 19 pages. 28 x 21.5 cm. Saddle-stitched. ISSN 0115-5547, ISBN 971-1022-80-X. US\$2.50 surface or US\$3.75 airmail.

A study on the availability and impact of the various International Center for Living Aquatic Resources Management (ICLARM) publications and other contributions to the fisheries research literature in the Philippines. The report confirms the Center's substantial impact through manual citation counts from 1979-1988. Includes appendices of ICLARM's citation performances.

Bibliographies

J.L. Maclean and R.M. Temprosa

Bibliography on Indo-Pacific Red Tides

1989. 23 pages. 21.5 x 28cm. ISSN 0115-5997, ISBN 971-1022-59-1. US\$3.00 surface or US\$6.50 airmail. (Copies of the CDS-ISIS database are available on diskette on request; US\$12.50 for an air-mailed diskette.)

Red tides, especially of the dinoflagellate *Pyrodinium bahamense* var. *compressum*, have been increasing infrequency and have been spreading around the central Indo-Pacific region. This bibliography was prepared in response to the information needs of scientists and researchers working on red tides in this region.

Poster

Mangroves Must Live

44.5 x 59.5 cm. US\$1.20 surface or US\$4.50 airmail.

This full-color poster depicts the mangrove community and how it provides coastal protection, human livelihood, habitat and food for organisms.

Directories

T.E. Chua, M.A.A. Agulto, F.Y. Guarin and S.C. Guerrero

Directory of institutions and Scientists in the ASEAN Region involved in Research and/or Management Related to Coastal Areas

1989. 373 pages. 15.5 x 23 cm. Perfect. ISBN 971-1022-52-4. US\$2.50 surface or US\$12.50 airmail.

Lists 2,894 individuals and presents profiles of 211 government agencies, research institutions and NGOs. It serves as a tool to facilitate communication and networking among groups and individuals concerned with the protection and wise use of coastal resources.

M.A. Carigma and R.G. Morales (Compilers)

Directory of Educational and Training Opportunities in Fisheries and Aquaculture

1989.46 pages. 21.5 x 28 cm. Saddle-stitched. ISBN 971-1022-56-7. US\$3.50 surface or US\$6.50 airmail. (Copies of the DBase database are available on diskette on request; US\$12.50 for an airmailed diskette.)

Covering 70 countries worldwide, this directory lists 427 institutions that provide regular educational and training courses in fisheries and/or aquaculture at the high school, vocational, bachelor's, master's, or doctorate level. Includes information on language of instruction, areas of specialization and willingness to conduct individual training on request and to accept developing-country-applicants.

Software Series

M.L. Palomares and D. Pauly

User's Manual for the Fish Population Dynamics Plug-in Module for HP41CV Calculators

1987. 5 pages. 21.5 x 15 cm. ISSN 0116-4964. Distributed with a custom-made plug-in module for HP41CV calculators. US\$187.00 airmail.

Presents a mode of operation and contents of a custom-made "Fish Population Dynamics" plug-in memory device for Hewlett-Packard HP41CV calculators or HP 41C with Quad Memory Module.

F.C. Gayanilo, Jr., M. Soriano and D. Pauly

A Draft Guide to the Compleat ELEFAN

1988.65 pages. 21.5x28 cm. ISSN 0116-6964. Distributed with a 12-diskette (5-1/4") Compleat ELEFAN package including a sample data disk. US\$62.50 airmail.

This user-friendly software incorporates help messages and graphic representations of all data and results. Seven major routines help analyze length-frequency and related data (e.g., growth increment data) through various approaches that cover growth, mortality, selection, recruitment, population and related estimates. This software can be implemented on an IBM PC/XT/AT or compatible microcomputer with a CGA or Hercules card (or their compatibles).

J.M. Vakily

Estimation and Comparison of Fish Growth Parameters from Pond Experiments: A Spreadsheet Solution

1988.12 pages. 21.5 x 28 c.m. ISSN 0116-6964. Distributed with one 5-1/4" diskette. US\$19.00 airmail.

Presents a method to estimate and compare the growth of fish in pond experiments using a Gulland/Hott plot. The method is implemented on a LOTUS 1-23 "spreadsheet" allowing easy data editing and analysis. An example is provided along with a 5 1/4" diskette for use with an IBM/PC/XT/AT or compatible microcomputers.

Education Series

A.T. White

Coral Reefs: Valuable Resources of Southeast Asia

1987. 36 pages. 15 x 22.5 cm. Saddle-stitched. ISSN 0116-5720, ISBN 971-1022-33-8. US\$1.75 surface or US\$6.50 airmail.

Coral reef ecosystems are vulnerable resources important to the economic well-being of coastal people. This book makes a case for the rational and sustainable use of coral reefs to ensure their long term survival and viability. Includes information on: ecology and distribution, value, coral reef plants and animals, threats and conservation.

A.T. White

Marine Parks and Reserves: Management for Coastal Environments in Southeast Asia

1988 36 pages. 15 x 22.5 cm. Saddle-stitched. ISSN 0116-5720, ISBN 971-1022-39-7. US\$1.75 surface or US\$6.50 airmail.

This book briefly discusses the plight of coastal resource habitats and explains how marine parks and reserves can serve as specific management approaches for these areas.

L.M. Cabrera

There Is Still Hope

1988. 16 pages. 15 x 23 cm. Saddle-stitched. Free upon request.

Full color comics (in English) illustrating the destructive effects of dynamite fishing. Also available in Pilipino.

M.D. Fortes

Seagrasses: A Resource Unknown in the Asean Region

1989. ISSN 0116-5720, ISBN 971-1022-51-6. US\$2.00 surface or US\$6.25 airmail.

The book discusses the importance and status of ASEAN seagrasses as a resource. Presents a Philippine case study of their biology and ecology and identifies threats as well as strategies to successfully implement a management plan for the use and protection of seagrasses

R.M. Temprosa, N.I. Jhocson, N.R. Balagapo and E.B. Gonzalez (Compilers)

ICLARM Library Serial Holdings List

1989.99 pages. 21.5 x 28 cm. Perfect. ISSN 01164720, ISBN 971-1022-69-9 S\$8.50 surface or US\$11.50 airmail.

A listing of over 800 serial holdings of the ICLARM library, including geographic, institutional and subject indexes.

B.A. Costa-Pierce, Rusydi, A. Safari and G.W. Atmadja

Culture of Common Carp in Floating Net Cages

1989.42 pages. 15 x 22 cm. Saddle-stitched. ISSN 0116-5720, ISBN 971-1022-78-9.

An illustrated manual on how to culture the common carp in floating cages. The techniques described were actually developed in the common carp culture in Saguling and Cirata Reservoirs in Bandung, Indonesia, and can be easily adapted to other sites.

B.A. Costa-Pierce, Rusydi, A. Safari and G.W. Atmadja

A Small-scale Hatchery for Common Carp

1989.42 pages. 15 x 22 cm. Saddle-stitched. ISSN 01 16-5720, ISBN 971-1022-73-7.

Gives comprehensive and well-illustrated techniques for establishing and maintaining an inexpensive hatchery for common carp, based on the techniques adopted in the common carp culture in Saguling and Cirata Reservoir regions in West Java, Indonesia.

B.A. Costa-Pierce, Rusydi, A. Safari and G.W. Atmadja

Growing Fish in Pen Systems

1989.40 pages. 15 x 22 cm. Saddle-stitched. ISSN 0116-5720, ISBN 971-1022-74-5.

Describes and fully illustrates the techniques for growing fish in pen systems, based on those adopted for the Saguling and Cirata Reservoirs in Bandung, Indonesia.

B.A. Costa-Pierce, G.W. Atmadja, Rusydi and A. Safari

Growing Fish in Cages

1989.43 pages. 15 x 22 cm. Saddle-stitched. ISSN 0116-5720, ISBN 971-1022-75-3.

A book illustrating simple techniques in growing fish in cages as used in the Saguling and Cirata Reservoirs in Bandung, Indonesia. Can be easily adapted to other locations.

Periodical

A.S.V. Pullin (Editor)

Aquabyte

16-24 pages. 28 x 21.5 cm. Saddle-stitched, ISSN 0116-6972. 3 issues/year. Vol. 1, No. 1, 1988. Free to members of the Network of Tropical Aquaculture Scientists.

The newsletter of the Network of Tropical Aquaculture Scientists, which links aquaculture scientists especially those engaged in research in the genetics of fish cultured in the tropics, tropical integrated agriculture-aquaculture farming systems and coastal aquaculture of tropical molluscs. For information, contact The Secretary, NTAS, ICLARM.

Publications of the Asian Fisheries Society

ICLARM hosts the Asian Fisheries Society's (AFS) Secretariat and handles its editorial and publishing functions. AFS publications should be ordered directly from the Society. Address orders and payment (payable to the Asian Fisheries Society) to: Asian Fisheries Society, MC P.O. Box 1501, Makati, Metro Manila, Philippines. The following are its publications:

Forum Proceedings

J.L. Maclean, L.B. Dizon and L.V. Hosillos (Editors)

The First Asian Fisheries Forum

1986. 727 pages. 21.5 x 28 cm. Smythe-sewn (hardbound), ISBN 971-1022-\$71. US\$50.00 surface or US\$75.00 airmail in Asia and the South Pacific, US\$80.00 airmail elsewhere.

Proceedings of the First Asian Fisheries Forum held in Manila, Philippines in 1986. Contains 167 papers; major reviews on Asian Fisheries research; author and species indexes.

R. Hirano and 1. Hanyu (Editors)

The Second Asian Fisheries Forum

1990. 991 pages. 28 x 21.5 cm. Smythe-sewn (cloth). ISBN 971-1022-79-6. US\$87.50 surface or US\$116.25 airmail.

Proceedings of the Second Asian Fisheries Forum held in Tokyo, Japan, in 1989. Contains 228 full and poster papers; major reviews on: Asian fisheries and aquaculture, developments in fish nutrition and advances in tropical fisheries research.

Abstracts of Papers Submitted to the First Asian Fisheries Forum

323 pages. 18 x 25 cm. Perfect. US\$14.00 surface or US\$22.50 airmail,

Special Publications

J.R. Arthur (Editor)

Fish Quarantine and Fish Diseases in South and Southeast Asia: 1986 Update

1987. 86 pages. 28 x 21.5 cm. Perfect. ISBN 971-1022-35-4. US\$6.50 surface or US\$10.00 airmail.

Report of the Asian Fish Health Network Workshop held in Manila, Philippines in 1986.

Fisheries Education and Training in Asia: Workshop Proceedings

1988. 162 pages. 28 x 21.5 cm. Perfect. US\$10.00 surface or US\$15.00 airmail.

Proceedings of the workshop held at Kitasato University in Iwate, Japan, in May 1987. Reviews the fisheries education and training systems in Asia and provides recommendations on fisheries manpower development.

S.S. De Silva (Editor)

Exotic Aquatic Organisms in Asia

1989. 154 pages. 21.5 x 28 cm. Perfect. ISBN 971-1022-53-2. US\$10.00 surface or US\$15.00 airmail.

These proceedings document the 1988 Workshop on Introduction of Exotic Aquatic Organisms in Asia held in Darwin, Australia. The meeting was an initial effort of scientists in the region towards

regulating exotic species introductions into Asia as these may pose problems such as the introduction of diseases, disruptive effects on aquatic communities and the genetic deterioration of host stocks.

S.S. De Silva (Editor)

Fish Nutrition Research in Asia

1989. 166 pages. 21.5 x 28 cm. Perfect. ISBN 971-1022-66-4. US\$10.00 surface, US\$15.00 airmail.

Proceedings of the Third Asian Fish Nutrition Network Meeting held in Bangkok, Thailand, in 1988.

Journal

J.L. Maclean (Executive Editor)

Asian Fisheries Science

Vol. 1, No. 1, December 1987. 100-150 pages per issue. 15 x 23 cm. Perfect. ISSN 0116-6514. Annual subscription (2 issues) US\$15 for individuals; US\$31.25 for institutions. Add US\$7.50 for airmail delivery in Asia or US\$10 for airmail elsewhere.

The Society's journal, covers all aspects of Asian fisheries and aquaculture research and serves as a medium of communication for fisheries and aquaculture scientists carrying out research related to the broad Asian region - effectively the Indo-Pacific faunal zone.

Directory

F. Brian Davy (Editor)

Asian Fisheries Directory

1989. 129 pages. 29.5 x 21 cm. Perfect. ISBN 971-1022-57-5. US\$15.00 surface or US\$18.75 airmail.

A trade directory of products and services, medication/chemicals, feeds, equipment, services and consultants; a listing of fisheries societies and networks, fisheries organizations, fisheries information services and fisheries educational and training institutions.

ICRAF

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General Information

The International Council for Research in Agroforestry (ICRAF) is an autonomous, non-profit research organization, established in 1977, with headquarters in Nairobi, Kenya. ICRAF is supported by voluntary contributions from bilateral, multilateral and private organizations, and is governed by a Board of Trustees with equal representation from developed and developing countries.

ICRAF's mandate is to initiate, stimulate and support research leading to more sustainable and productive land use in developing countries through the integration or better management of trees in land-use systems. In support of this mandate, ICRAF's strategy is:

- To develop the scientific discipline of agroforestry and maintain ICRAF's leading position in this field,
- To cooperate with national institutions in building their capability to design and implement agroforestry research programmes and to work with them in generating relevant and promising agroforestry technologies,
- To promote the use of appropriate agroforestry systems and technologies as tools for national development.

ICRAF's programme of work is carried out through four divisions: the Research Development Division (RDD), the Collaborative Programmes Division (COLLPRO), the Information and Communications Division (INFOCOMM) and the Finance and Administration Division.

HOW TO ORDER ICRAF PUBLICATIONS

ICRAF publications are available from the Editorial Assistant. Payment in convertible currency may be made by cheque, international money order, telegraphic transfer or bankers cheque, payable to the International Council for Research in Agroforestry.

Research and development institutions in developing countries may order single copies of individual titles free of charge, and libraries in developing countries may obtain free copies of all available publications.

In this catalogue, ICRAF publications are listed in the following categories:

- Periodicals
- Bibliographies
- Books, Proceedings and Reviews

- Science and Practice of Agroforestry
- Source Materials and Guidelines
- Reprints
- Agroforestry Systems Descriptions
- Working Papers
- Training and Education Reports

PERIODICALS

Agroforestry Today

24 pages. 21 x 29.6 cm. Saddle stitched.

Published quarterly in English and French. The magazine includes articles on agroforestry research, development, training, etc. Subscription is free and contributions are welcome.

Agroforestry Systems

Length varies. 14.7 x 21 cm. Perfect bound.

This journal is published by Martinus Nijhoff in the Netherlands in cooperation with ICRAF. It is an international, multidisciplinary journal that covers research on all aspects of agroforestry systems. For subscriptions, write to: Kluwer Academic Publishers Group, P.O. Box 322, 330 AH Dordrecht, The Netherlands.

Agroforestry Abstracts

21 x 29.6 cm. Saddle stitched.

A quarterly journal published by the Commonwealth Agricultural Bureaux International in association with ICRAF. For subscriptions, write to: Marketing and Sales Division, CAB International Forestry Bureau, Wallingford, Oxon OX10 8DE, UK.

BIBLIOGRAPHIES

L. Fortmann and J. Riddell

Trees and Tenure: an Annotated Bibliography for Agroforesters and Others

1985. 148 pages. 13.5 x 21.2 cm. Paperback.

This bibliography represents the first fruits of collaboration--initiated in 1982 -- between ICRAF and the Land Tenure Center of the University of Wisconsin at Madison in an effort to understand the traditional

tenure systems under which peasant cultivators (the target audience for agroforestry technologies) operate.

R. Labelle, L. Majisu and H. Munyua

Agroforestry Literature: A Selected Bibliography

1988. 272 pages. 17.6 x 25 cm. Paperback. ISBN 92-9059-0483. US\$6.50 plus surface mail (US\$2.00).

This bibliography covers the period from the mid-1979s to early 1986. It contains 531 references and serves as an introduction to the essential readings on agroforestry. Each bibliographic unit has been described according to the ICRAF in-house format and rules.

C.E. Harwood

Grevillea robusta: An Annotated Bibliography

1989. 124 pages. 17.6 x 25 cm. Paperback. ISBN 92-9059-072-6. US\$6.50 plus surface mail (US\$1.10).

The bibliography aims to provide a comprehensive summary of the information on *Grevillea robusta* published in English. It is directed primarily to people involved in forestry and agroforestry research, extension and production.

U. Muller and S.J. Scherr

Technology Monitoring and Evaluation in Agroforestry Projects: An Annotated Bibliography

1989. 192 pages. 17.6 x 25 cm. Paperback. ISBN 92-9059-073-4. US\$6.50 plus surface mail (US\$2.00).

This bibliography presents a selection of the most useful material collected during the "state of the art" review of activities and methods employed by development projects involved in agroforestry conducted by ICRAF in 1988-89. The 202 references provide an overview of the types of methods currently available for technology monitoring and evaluation in agroforestry.

H. Munyua, B.M. Bondole and L. Majisu

Agroforestry Literature: a Selected Bibliography on Sub-Saharan Africa

1989. 110 pages. 17.6 x 25 cm. Paperback. ISBN 92 9059 063 7. US\$6.50 plus surface mail (US\$2.00).

The 244 references contained in this bibliography serve as an introduction to the essential readings on agroforestry in subsaharan Africa. The bibliography covers the period from 1961 to early 1988. References have been selected from the ICRAF library database.

BOOKS, PROCEEDINGS AND REVIEWS

P.G. von Carlowitz

Multipurpose Tree and Shrub Seed Directory

1986. 265 pages. 21 x 29.6 cm. Paperback. US\$20.00 plus surface mail (US\$5.00).

The international workshop on multipurpose trees held in Washington, DC in 1983 recommended the publication by ICRAF of this specialized directory on multipurpose tree seed. The directory aims to facilitate communication between institutions and individuals who require seeds of multipurpose trees on the one hand and suppliers on the other.

H.L. Gholz (Editor)

Agroforestry: Realities, Possibilities and Potentials

1987. 227 pages. 16 x 24 cm. Paperback. ISBN 90-247-3591-2. US\$15.00 plus surface mail (US\$3.60). Martinus Nijhoff, Dordrecht, The Netherlands in cooperation with ICRAF.

This book records the results of a series of seminars held at the University of Florida between October 1985 and June 1986 to discuss the general topic of agroforestry.

J.B. Raintree (Compiler and Editor)

D&D User's Manual: an introduction to Agroforestry Diagnosis and Design

1987. 110 pages. 23.5 x 21 cm. Spiral bound. US\$12.50 plus surface mail (US\$2.00). Available in English and in French.

This manual has been written in response to popular demand for a user-friendly introduction to ICRAF's methodology for agroforestry diagnosis and design.

H.A. Stepler and P.K.R. Nair (Editors)

Agroforestry: a Decade of Development

1987. 344 pages. 18 x 25.7 cm. Hardback. ISBN 929059-036-X. US\$30.00 plus surface mail (US\$10.00).

This book was published in commemoration of ICRAF's 10th anniversary. The contributors to this volume are leaders in their fields and active in promotion of agroforestry research and development. The issues they raise and the problems they address point to one ineluctable conclusion: the need for interinstitutional cooperation at all levels--national, regional and international.

E. Zulberti (Editor)

Professional Education in Agroforestry: Proceedings of an international Workshop held in Nairobi, Kenya, 5-10 December 1982

1987. 378 pages. 15 x 20.5 cm. Limp. US\$15.00 plus surface mail (US\$3.60).

This volume summarizes activities and plans for the teaching of agroforestry in the major geographical regions of the world. It includes workshop recommendations for programme, course content, teaching methods and teaching materials.

A.M. Kilewe, K.M. Kealey, K.K. Kebaara (Editors)

Agroforestry Development in Kenya: Proceedings of the Second Kenya National Seminar on Agroforestry

1989. 534 pages. 20.5 x 29.2 cm. Limp. ISBN 92-90590688. US\$15.00 plus surface mail (US\$10.00).

This publication contains the full proceedings and recommendations of Kenya's second seminar on agroforestry, held 7-16 November 1988 to: highlight trends in agroforestry science and practice; facilitate the exchange of ideas and experiences through plenary sessions, working-group discussions and field tours and set general guidelines and make specific recommendations for national agroforestry research and development strategy for the next decade.

P.A. Huxley and S.B. Westly (Editors)

Multipurpose Trees: Selection and Testing for Agroforestry

1989. 120 pages. 17.6 x 25 cm. Paperback. ISBN 92-9059-067-X. US\$5.00 plus surface mail (US\$2.00)

This collection of papers was presented at a two-day technical seminar on the occasion of ICRAF's 10th anniversary. The contributions cover the steps required for the selection and testing of woody species for particular biophysical settings, agroforestry technologies and land-use systems.

P.K.R. Nair (Editor)

Agroforestry Systems in the Tropics

1989. 664 pages. 16 x 24 cm. Limp. ISBN 90-247-3791-5. US\$18.00 plus surface mail (US\$10.00). Kluwer Academic Publishers, Dordrecht in cooperation with ICRAF.

This book gives complete, up-to-date information on agroforestry systems in Asia, Africa, Latin America and the Pacific. Detailed portraits of more than 25 systems used in these regions include their history, extent and the varied productive and protective roles they play in the land-use strategies of developing countries.

W.E. Reifsnyder and T.O. Darnhofer (Editors)

Meteorology and Agroforestry: Proceedings of an international Workshop on the Application of Meteorology to Agroforestry systems Planning and Management, Nairobi, 9-13 February 1987

1989. 556 pages. 17.6 x 25 cm. Limp. ISBN 92-9059-059-9. US\$25.00 plus surface mail (US\$10.00).

The papers in this volume address two themes: the interest of the agroforestry community in how knowledge of the atmospheric sciences can contribute to agroforestry, and the scarcity of hard information on meteorology and agroforestry.

SCIENCE AND PRACTICE OF AGROFORESTRY

This is a series of small booklets on a range of scientific and practical topics in agroforestry. The series is designed for high school and university students, resource planners, administrators and scientists and development personnel in agroforestry and related disciplines.

P.K.R. Nair

Soil Productivity Aspects of Agroforestry

1974.85 pages. 17.6 x 25 cm. Paperback. US\$5.00 plus surface mail (US\$1.10).

That agroforestry depends upon self-maintenance, soil productivity is of utmost concern. This booklet examines the likely effect of agroforestry practices on the long-term soil productivity and suggests appropriate management practices.

J. Burley

Global Needs and Problems of the collection, Storage and Distribution of Multipurpose Tree Germplasm

1985.192 pages. 17.6 x 25 cm. Paperback. US\$5.00 plus surface mail (US\$2.00),

In this booklet, Dr. Burley describes the special characteristics of multipurpose-tree germplasm and the major problems and issues in taxonomy, exploration, collection, evaluation and conservation of species and populations.

D. Rocheleau, F. Weber, A. Field-Juma

Agroforestry in Dryland Africa

1989. 312 pages. 17.6 x 25 cm. Paperback. ISBN 92-9059-049-1. US\$12.00 plus surface mail (US\$5.00).

This practical handbook is designed to be used in subhumid and semi-arid regions of Africa by researchers working with grassroots organizations, community extension and development workers, development specialists in government agencies and national research institutes, and extension officers. It provides an introduction to agroforestry and gives a description of the process of working with community members to identify and adapt agroforestry practices to meet local needs.

Anthony Young

Agroforestry for Soil Conservation

1989.288 pages. 14.8 x 22.8 cm. Paperback. ISBN 0-85198-648-X. US\$27.95 (including airmail). CAB International, Wallingford, UK in cooperation with ICRAF.

This is a review of the potential of agroforestry to contribute to soil conservation. It aims to summarize the present state of knowledge, including both known capacity and apparent potential, and to indicate the needs for research.

SOURCE MATERIALS AND GUIDELINES

These revisable booklets cover biophysical approaches for designing, establishing, and assessing agroforestry experiments with multi-purpose trees and shrubs. They are intended to provide source material for workers who are preparing field guides, research manuals, or lecture notes on agroforestry. (P.A. Huxley, compiler and editor). \$3.00; surface mail \$1.10.

Section 6: Useful Topics for Information

Part 6D: Baumer, M. Authors of Botanical Binomes. 26 pp.

Part 6E: Baumer, M. Agroforestry and Watershed Management: An English-French and French-English lexicon. 24 pp.

REPRINTS

The ICRAF reprint series consists of articles or chapters first published by ICRAF staff members in other publications or papers by other researchers first published elsewhere but originally presented at conferences organized or sponsored by ICRAF. \$2.00 each; surface mail \$0.60 each.

Huxley, P.A. (1983). Comments on agroforestry classifications: with special reference to plant aspects. In P.A. Huxley, ed. *Plant Research and Agroforestry*. Nairobi: ICRAF, pp. 161-71. IR-9.

Huxley, P.A. (1983). Phenology of tropical woody perennials and seasonal crop plants with reference to their management in agroforestry systems. In P.A. Huxley, ed. *Plant Research and Agroforestry*. Nairobi: ICRAF, pp. 503-25. IR-13.

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Kozlowski, T.T. and Huxley, P.A. (1983). The role of controlled environments in agroforestry research. In P.A. Huxley, ed. *Plant Research and Agroforestry*. Nairobi: ICRAF, pp. 551-67. IR-14.

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Training and Educational Reports are compiled from the training courses organized by ICRAF. No Charge.

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The Winrock International Institute for Agricultural Development was established in 1985, and incorporates more than 50 years of combined organizational experience in providing technical assistance and professional expertise to international agricultural development. One of the largest independent entities engaged in international agricultural development, Winrock International was created through the merging of the Agricultural Development Center (A/D/C), the International Agricultural Development Service (IADS), and the Winrock International Livestock Research and Training Center. Winrock International is an autonomous, nonprofit corporation.

Mission

Winrock International's mission is to help people around the world by increasing agricultural productivity and improving nutrition. Since agricultural development is by its nature a team effort, cooperative relationships are the key to its success. Accordingly, Winrock staff members work with host governments, private voluntary organizations, producer groups, and others to provide research and analysis, education and training, technical assistance, and communications services. Areas of emphasis are human resources, renewable resources, food policy, animal agriculture and farming systems, and agricultural research and extension.

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R. Stevenson and V. O. Locke

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both official and black market exchange rates. The text explains the distinguishing characteristics of the major root and tuber crops and discusses problems in gathering and using data on these important food sources that are often overlooked by policymakers.

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Susan MacMillan, ed. Looks at compatibility between wildlife and livestock in East Africa. Covers competition for rangeland, parasite/disease relationships, use of wildlife, human population pressure, range management, and policy. Published jointly with the Inter-African Bureau for Animal Resources.

GTZ

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What is GTZ?

The Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) is a non-profit enterprise owned by the Federal Republic of Germany, represented by the Federal Minister for Economic Cooperation (BMZ) and the Federal Minister of Finance (BMF).

The GTZ has existed in its present form since January 1, 1975, when it took over the activities of two previous development agencies -- the Bundesstelle für Entwicklungshilfe (BfE) and the Deutsche Förderungsgesellschaft für Entwicklungslander (GAWI), to streamline operations.

The basis of the GTZ's work in official technical operation is a General Agreement concluded on December 12, 1974. This agreement clearly delineates the tasks between the Federal Ministry for Economic Cooperation (BMZ) which is responsible for development policy and the GTZ as implementing agency.

- The BMZ, the negotiating partner of the governments of the developing countries, defines the general development policy aims and the objectives of individual activities and supervises their implementation; it decides what projects are to be supported and sets the financial framework in its commissions to the GTZ.
- The GTZ carries out BMZ commissions under its own responsibility, either itself or by recalling in other state or private enterprises; it supports the BMZ in the further development of principles and instruments of development policy.

What does GTZ?

GTZ puts development policy into practice. Most of its work is commissioned by the Government of the Federal Republic of Germany whose July 1980 "Policy Paper on German Cooperation with Developing Countries" defines technical cooperation as follows:

"The purpose of technical cooperation is to enhance the performance of manpower and institutions in the developing countries. It involves the assignment of technical personnel and the supply of technical equipment. As a rule, technical cooperation are services granted on a non-repayable basis. In the more advanced developing countries, this cooperation is either partly or wholly against payment."

In addition to implementing Federal German development policy, the GTZ also takes direct commissions against payment from developing countries or from international organizations and it operates projects with its own funds on a limited scale.

On average in any given year the GTZ is involved in 1,700 projects in 90 countries. They are implemented by the GTZ's own field staff or by consultant firms and include the elaboration of studies and evaluations, handling of financial contributions, food aid, promotion of trade fair participation, etc. More than 10,000 supply consignments are made to projects every year.

From 1975 to 1982 annual turnover rose from DM 460 to DM 945 million. Commissions in hand developed similarly over this period from DM 1.379 to DM 3.126 million. At the end of 1982, 1445 GTZ fieldstaff and 740 experts employed by consultant firms were on assignment abroad.

Main tasks

Technical cooperation projects span almost the entire economic and social spectrum of the developing countries. GTZ tasks and services are correspondingly broad:

- Assignment and funding of experts for agreed projects as well as advisers, instructors, specialists, appraisers, and short-term experts;
- supply of equipment and materials for the facilities supported, supply of industrial and agricultural production inputs, provision of services and works;
- support of the reintegration in their home countries of expert manpower from developing countries who trained in the Federal Republic of Germany and wish to return home;
- salary topping up subsidies for German experts under direct contract to a developing country;
- coordination of the initial and further training of specialists and managerial personnel from developing countries either in their own countries, in other developing countries, in the Federal Republic of Germany or in other industrial countries;
- subsidization of the cost of training programmes carried out by companies in the developing countries;
- financial contributions to projects and programs of efficient implementing agencies in developing countries.

To achieve these tasks the development projects are planned and implemented by three departments:

Department 1 : Agriculture, Health and Rural Development

Department 2: Science and Technology, Education, Vocational Training, Industry and Trade

Department 3: infrastructure

Agriculture, Health and Rural Development

The promotion and development of rural areas has always been a top priority in German development cooperation with developing countries. The activities of the Department of Agriculture, Health and Rural Development are therefore determined by the following goals:

- to raise and diversify production in agriculture, forestry and fisheries
- to create more jobs by promoting the agricultural structure,
- to improve storage, distribution, marketing, and processing of agricultural products
- to establish appropriate production, credit, and marketing organizations,
- to intensify agricultural research and technology,
- to improve living conditions by supporting health, nutrition, and family planning programs

The department cooperates closely with national and international research institutions and organizations in its research and development activities.

Publications

Experience gained in gtz projects is available to a wide circle of readers in gtz publications.

The GTZ series of publications can be obtained directly from the GTZ-Verlagsgesellschaft mgH, Bruchwiesenweg 19, D-6101 Roßdorf 1.

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English. 1979. 330 pages. Numerous photographs, tables, graphics. Order no.: 110058. DM 30. No ISBN.

Programmes et strategies d'action prioritaires pour le
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Abrégé de production cunicole tenant compte des conditions spécifiques des pays en développement

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Technische Zusammenarbeit Im ländlichen Raum - Pflanzen- und Vorratsschutz. Was - wo - wie 1986

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Nienhaus, Franz

Virus- and similar diseases in tropical and subtropical areas

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Importance, biology and control of the potato moth In Marokko. Importance et biologie de la tergue de la pomme de terre, la lutte contre ce ravageur au Maroc

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Experiences gained in the control of grasshoppers by helicopter in Nigeria in 1975 and 1976

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Afrass, Ahmed and Mosich, Lutz

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Weidner, Herbert; Rack, Gisela

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Order no.: 000129. DM 30. ISBN 3-88085-185-9.

Conert, Hans-Joachim (editor)

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Bischof, Friedrich

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Whistler, W. Arthur

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considerant particulièrement la Tunisie et le Maroc -
Légumineuses: Fève, Harcot, Pols chiche, Luzerne**

French. 1976. 45 pages. Illustrations. Order no.: 110013. DM 10.
No ISBN.

**La Defense des Cultures en Afrique du Nord en
considerant particulièrement la Tunisie et le Maroc -
Olivier**

French. 1976. 30 pages. 28 colour photographs. Order no.:
1 10014. DM 10. No ISBN.

**La Defense des Cultures en Afrique du Nord en
considerant particulièrement la Tunisie et le Maroc -
Betterave sucrière**

French. 1976. 26 pages. 28 colour photographs. Order no.:
110015. DM 10. No ISBN.

**La Défense des Cultures en Afrique du Nord en
considerant particulièrement la Tunisie et le Maroc -
Solonacées: Tomate, Aubergine, Poivron, Pomme de
terre**

French. 1976. 67 pages. Colour photographs. Order no.: 11 001 6.
DM 10. No ISBN.

**La Defense des Cultures en Afrique du Nord en
considerant particulièrement la Tunisie et le Maroc -
Céréales et Mais**

French. 1976. 30 pages. 40 colour photographs. Order no.:
110017. DM 10. No ISBN.

**La Défense des Cultures en Afrique du Nord en
considerant particulièrement la Tunisie et le Maroc -
Arbres fruitiers: Pêcher, Amandier, Abricotier,
Pommier, Poirier**

French. 1976. 35 pages. 48 colour Photographs. Order no.:
110018. DM 10. No ISBN.

Jürgens, Gerhard (editor)

Curso Básico sobre Control de Malezas en la República Dominicana

Spanish. 1975. 173 pages. Order no.: 000023. DM 10. ISBN 3-88085-010-0.

Kopisch-Obuch, Friedrich-W.; Ulsperger, Walter; Werner, Hans.J. and Wieland, Thomas

Rückstandsprobleme im Pflanzenschutz in der Dritten Welt. Ein Beitrag des GTZ-Rückstandslabors

German. 1978. 67 pages. 35 illustrations. Order no.: 000063. DM 14.50. ISBN 3-88085-057-7.

Pesticide Residue Problems In the Third World

English. 1979. 64 pages. Order no.: 000082. DM 14.50. ISBN 3-88085-074-7.

Problèmes de résidus résultants de la protection des végétaux dans le tiers monde

French. 1982. 67 pages. 35 illustrations. Order no.: 000096. DM 14.50. ISBN 3-88085-127-1.

Problemas de residuos de pesticidas en el Tercer Mundo

Spanish. 1981. 67 pages. 35 illustrations. Order no.: 000095. DM 14.50. ISBN 3-88085-057-7.

Schmutterer, H.; Ascher, K.R.S. and Rembold, H.

Natural Pesticides from the Neem Tree (*Azadirachta Indica* A. Juss)

Proceedings of the First International Neem Conference Rottach-Egern, 16.-18. June 1980

English. 1981. 300 pages. Numerous tables, graphics, and BW-photographs. Order no.: 110090. DM 35. No ISBN.

Schnutterer, Heinz and Ascher, K.R.S.

Natural pesticides from the neem tree (*Azadirachta indica* A. Juss) and other tropical plants. Proceedings of the Second International Neem Conference, Rauschholrhausen, 25-27. May 1983

English. 1984. 604 pages. 7 colour photographs, Numerous BW-photographs and illustrations. Order no.: 000161. DM 45. ISBN 3-88085-156-5.

Schnutterer, H. and Ascher, K.R.S.

Natural pesticides from the neem tree and other tropical plants. Proceedings of the Third International Neem Conference, Nairobi, Kenya, 10.-15. July 1986

English. 1987. 704 pages. Order no.: 000206. DM 49.40. ISBN 3-88085472-X.

Natural Pesticides from the Neem Tree and other Tropical Plants

English. 1984. 52 pages. Order no.: 770099. Free of charge. No ISBN.

Pesticides naturels de l'arbre de Nim et des autres plantes tropicales

French. 1984. 52 pages. Order no.: 770097. Free of charge. No ISBN.

Pesticidas naturales del arbol del Neem y de otras plantas tropicales

Spanish. 1984. 52 pages. Order No.: 770096. Free of charge. No ISBN.

Posamentier, Heimo

Rodents In Agriculture. Review of Findings in Bangladesh

English. 1989. 112 pages. 11 BW-photographs, 2 figures, 12 drawings, and 15 tables. Order no.: 110176. DM 22. ISBN 3-88085-306-1.

Adhikarya, Ronny; Posamentier, Heimo

Motivating farmers for action. How strategic multi-media campaigns can help.

English. 1987. 212 pages. Numerous figures, tables and illustrations. Order no.: 0001 85. DM 34.50. ISBN 3-88085-289-8.

Moreira, Irene (editor)

Roedores de Campo e seu Controlo

Portuguese. 1986. 144 page. Colour photographs and tables. Order no.: 1 101 78. DM 32.50. ISBN 3-88085-308-8.

Field rodents and their control

English. 1989. 151 pages. Order no.: 110206. DM 32.50. ISBN 3-88085-359-2.

Rodent Pests and their Control

English. 1981. 204 pages. With numerous illustrations. Order no.: 11 0089. DM 58.50. No ISBN.

Problèmes de Post-Récolte, Documentation sur un Seminaire OUA/GTZ. (Lomé/Togo, Mars 1980)

French. 1980. 282 pages. Order no.: 0001 13. DM 15.40. No ISBN.

Post Harvest Problems. Documentation of a OAU/GTZ Seminar (Lomé/Togo, March 1980)

English. 1981. 258 pages and 33 pages appendix. Order no.: 0001 15. DM 15.40. No ISBN.

Dichter, David

Manual on improved farm and village level grain storage methods

English. 1978. 243 pages. Order no.: 110049. DM 16. No ISBN.

Homann, Jürgen and Zettelmeyer, Winfried J.

Potato Storage - An Example at the Small Scale Farm Level in Kenya

English. 1980. 96 pages. 6 colour photographs, numerous drawings of constructions, tables, and graphics. Order no.: 1 10072. DM 22. ISBN 3-88085-097-6.

Leppack, Eberhardt and Rosskamp, Robert

Almacenamiento de Papas en Panamá - un ejemplo para zonas tropicales y subtropicales

Spanish. 1978. 102 pages. 28 colour photographs and 13 drawings. Order no.: 000056. DM 26.50. ISBN 3-88085-059-3.

Potato Storage in Panama

English. 90 page. Order no.: 000077. DM 26.50. ISBN 3-88085-073-9.

Forest Resources Management

Grotthuss, Otto, Frhr. von (editor)

Die Bundesrepublik Deutschland und die Forstwirtschaft der Dritten Welt

German. 1980. 148 pages. Order no.: 000084. DM 12.50. ISBN 3-88085-099-2.

Forstliche Beiträge der Bundesrepublik Deutschland zur Entwicklung des ländlichen Raumes in der Dritten Welt - Forestry and the development of rural areas in third world countries

German and English. 1986. 404 pages. 51 colour photographs and 1 world map. Order no.: 0001 86. DM 36. ISBN 3-88085-292-8.

Weidelt, H. J. (editor)

Manual of Reforestation and Erosion Control for the Philippines

English. 2nd edition 1988. 569 pages. Order no.: 000022. DM 18. ISBN 3-88085-020-8.

Seeber, G.; Weidelt, H.J. and Banaag, V.S.

**Dendrological Characters of Important Forest Trees
from Eastern Mindanao**

English. 1979 2nd edition. 440 pages. Numerous drawings and
BW-photographs. Order no.: 000073. DM 20.50. ISBN 3-88085-
068-2.

Weidelt, Hans-Joachim and Banaag, Valeriano S.

**Aspects of Management and Silviculture of Philippine
Dipterocarp Forests**

English. 1982. 308 pages. Order no.: 000132. DM 18. ISBN 3-
88085-157-3.

Hueck, Kurt

**Los Bosques de Sudamérica - Ecología, composición e
importancia económica**

Spanish. 1978. 476 pages. With map of the vegetation of South
America. Order no.: 000058. DM 49.50. ISBN 3-88085-053-4.

Klose, Franz

**A brief history of the German forest I Achievements and
mistakes down the ages - What lessons can be learned
for forestry in developing countries?**

English. 1985. 89 pages. Colour photographs and tables. Order
no.: 110158. DM 28. ISBN 3-88085-249-9.

Zech, Wolfgang

**Etudes sur l'Ecoilogie des Ligneux d'Interêt Forestier
dans l'Afrique de l'Ouest Semi-Aride**

French. 1984. 394 pages. 22 colour photographs, 2 BW-photo-
graphs, 31 illustrations, and 52 tables. Order no.: 000154. DM
30.50. ISBN 3-88085-214-6.

Dudek, Siegfried; Förster, Bernhard and Klissenbauer, Karl
Lesser known Liberian Timber Species. Description of physical and mechanical properties, natural durability, treatability, workability and suggested uses

English. 1981. 168 pages. 48 colour photographs, Numerous drawings and tables. Order no.: 11 0091. DM 1 1.50. ISBN 3-88085-120-4.

Becker, Gunther

Holzerstörung durch Termiten im Zentralafrikanischen Kaiserreich - Destruction du bois par les termites dans l'Empire Centrafricain

German and French. 1977. 96 pages. 16 illustrations. Order no.: 000041. DM 12.60. No ISBN.

Liese, Walter

Bamboos - Biology, silvics, properties, utilization

English. 1985. 136 pages. 57 colour photographs, and 14 BW-photographs drawings. Order no.: 0001 80. DM 39.50. ISBN 3-88085-273-1.

IIMI

International Irrigation Management Institute

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GENERAL INFORMATION

Some 15 percent of the world's total area of cultivated land is irrigated: of this land more than 70 percent is located in the world's developing regions. The 'Green Revolution', which triggered phenomenal growth in agricultural productivity, income and other benefits during the 1960s and 1970s, owed its success to irrigation. In many cases, however, the desired benefits of irrigation (particularly the higher crop yields that were anticipated) fall far short of expectations. Raising the productivity of irrigated areas to universally higher standards through better management is one of the greatest challenges world agriculture faces today and in the future.

It was to help meet this challenge that IIMI, the International Irrigation Management Institute, was founded in 1984, as an independent, international nonprofit organization with its headquarters in Sri Lanka, and decentralized field operations in more than 10 countries in Africa and Asia. IIMI is the first world body set up specifically to promote irrigation management concerns. The Institute undertakes multidisciplinary, collaborative research in operating irrigation systems, thematic research on management issues of broader or multicountry concerns, management training, and the exchange and dissemination of information.

The Institute's priority research themes are: irrigation institutions; water resources for irrigation; financial resources for system sustainability; irrigation facilities; irrigation organizations; support services to farmers; institutional change.

The Institute's mission is to strengthen national efforts to improve and sustain the performance of irrigation systems in developing countries, through the development and dissemination of management innovations. Irrigation management is seen as the process in which institutions or individuals set objectives for irrigation systems; establish appropriate conditions; and identify, mobilize and use resources, so as to attain these objectives; while ensuring that all these activities are performed without causing adverse effects. Pursuance of these objectives requires research, technological innovation and dissemination of innovations through training and information. An essential part of the information dissemination process is conducted through technical publications.

HOW TO OBTAIN IIMI PUBLICATIONS

Publications may be obtained by writing to one of the following:

Distribution Section

Information Office

International Irrigation Management Institute (IIMI)

P.O. Box 2075, Colombo, Sri Lanka.

Telephones: (94-1) 546561/544580

Telexes: 22318 or 22907 IIMIHQ CE

Telefax: (94-1) 544584

in North America from:

Agribookstore

161 1 North Kent Street

Arlington, Virginia 22209, USA.

and in Europe from:

S. Toeche-Miltier GmbH

Triops Department

Hindenburgstrasse 3

D-6100 Darmstadt

Federal Republic of Germany

Telephone: (49-6151) 311551

Publications are distributed free of charge to selected audience groups. Certain publications are offered free on demand; others will normally be distributed, subject to availability, free of charge to institutions and individuals working in irrigation and related areas in the Third World. Publications are also available to readers on a sales basis; for these a dual-tier price system is applied. The cost of despatch will be added to the prices indicated; sea mail will be used unless orders specify air mail (for which there will be an additional charge).

Please note that free copies (apart from review copies) may only be obtained from the Institute.

The Information Office offers a photocopy service for publications listed as "out of print" for US\$0.10 a page.

Unless otherwise indicated, all titles have been published by the Institute at its headquarters.

GENERAL PUBLICATIONS

International Irrigation Management Institute

The strategy of the International irrigation Management institute

1989. viii + 66 p. Softcover. ISBN 92-9090-104-7. Price US\$10. US\$5 (developing countries).

This publication sets out the strategy of the International Irrigation Management Institute (IIMI), with the proposed directions for IIMI during the next 5 to 10 years. The Institute's strategy follows lines proposed by Dr. Selcuk Ozgediz, Management Advisor to the Consultative Group on International Agriculture Research (CGIAR). It uses his definition of strategy as one that "describes the most desirable vision of an organization's future, outlines the essential elements of the course that it intends to follow to realize that vision, and provides justification for the identified course."

International Irrigation Management Institute

irrigation management for the 1990s: A brief guide to the strategy of the international irrigation Management Institute

1989. 28 p. Softcover. ISBN 92-9090-105-5. Price US\$4. US\$2.50 (developing countries).

This document summarizes the strategy of the Institute (also available in full) in a readable and illustrated form destined for the general reader interested in the work and objectives of the Institute, and for the national irrigation manager or trainer requiring a rapid insight into the problems of irrigation management and the activities of IIMI.

SERIALS

Annual Report

The Institute's Annual Reports provide highlights of the year's activities in keeping with the Institute's strategic plans and operational achievements. These reports also provide the year's review of financial and organizational data.

Annual Report 1984-85

1986. vii + 38 p. Softcover.

Annual Report 1986

1987. ii + 52 p. Softcover. ISBN 955-579-001-9.

Annual Report 1987

1988. vi + 92 p. Softcover. ISBN 955-579-005-1.

Annual Report 1988

1989. vi + 58 p. Softcover. ISBN 92-9090-107-1.

IMIN Bibliography: A selected bibliography on Irrigation Management

A biannual bibliography selected from documents entered in the Irrigation Management Information Network (IMIN) database. Publications and information from over 100 countries are indexed. Monographs, Conference Proceedings, Government publications, Technical and Research reports, Dissertations, and Journal articles. Chapters in books are included. Most citations are in English. Editor, Ramya de Silva. Twice Yearly.

Free selectively upon request. ISSN 1015-1680.

Volume 1 Number 1

1987 April. 244 p. Stapled.

Supplement to Volume 1 Number 1. Database Data Input Manual

1987 July. iv + 83 p. Stapled.

Volume 1 Number 2

1988 June. 68 p. Stapled.

Volume 2 Number 1

1989 June. 58 p. Stapled.

PERIODICALS

IIMI Review

The Institute's principal periodical reports on a regular basis the major timely issues in irrigation management, and their relationship to the wider areas of food productivity and sustainability, and the Institute's current activities. Editor, John L. Colmey. Four times a year (from 1990).

Subscription price US\$15 per year. ISSN 1012 831 X.

Volume 1 Number 1

1987 May. 18 p. Stapled.

Volume 2 Number 1

1988 April. 28 p. Stapled.

Volume 2 Number 2

1988 August. 28 p. Stapled

Volume 3 Number 1

1989 September. 24 p. Stapled.

Volume 3 Number 2

1989 December. 28 p. Stapled

NEWSLETTERS

Farmer-managed irrigation systems Newsletter

The Newsletter of the farmer-managed irrigation systems network contains news and views from the membership. Appears three times a year. Editor was previously David Groenfeldt and from 1989, Shaul Manor.

Available selectively upon request from the Institute. ISSN 1012 988 X.

Number 1

1987 April. 20 p. Stapled.

Number 2

1987 August.. 20 p. Stapled.

Number 3

1988 February. 28 p. Stapled.

Number 4

1988 May. 28 p. Stapled.

Number 5

1988 November. 28 p. Stapled.

Number 6 (and list of members)

1989 (September). 28 + 16 p. Two stapled volumes.

TECHNICAL PUBLICATIONS AND MONOGRAPHS

These books are aimed at wider international audiences. Monographs are generally longer works (100-400 pages) destined for similar audience. Publications are normally be written into project or research design.

David Groenfeldt and Joyce Lewinger Mook

Social science perspectives on managing agricultural technology

1989. xv+ 223 p. B5. Softcover. ISBN 92-9090-103-5. Price US\$25. US\$12.50 (developing countries).

This workshop proceedings presents the research experience of 15 social scientists at their respective international agricultural research centers. In addition to highlighting the contributions social scientists can make in the field of agricultural research, the papers offer a candid look at the kinds of work the different centers are currently undertaking to develop production technologies that fit the needs of their particular target areas or client groups.

Asian Development Bank and International Irrigation Management Institute

irrigation service fees

1987. xvi + 114 p. B5. Softcover.

Published by the Asian Development Bank (ADB). Free on request.

This book documents the proceedings of the Regional Seminar on Irrigation Service Fees held in Manila, the Philippines 21-25 July 1986. The seminar discussions reported here were based on an IIMI study of experiences with irrigation service fees in 13 Developing Member Countries of the ADB.

Edward D. Martin and Robert Yoder (Editors)

Public intervention in farmer-managed irrigation systems

1989. iv + 310 p. B5. Softcover. ISBN 92-9090-101-9. Price US\$27.50. US\$13. 50 (developing countries).

In many countries, farmer-managed irrigation systems account for a significant portion of the irrigated area and food produced. A growing recognition of their importance has led irrigation agencies to assist these systems by increasing water supplies and improving reliability. Results have been mixed. To identify and define research issues and appropriate methodologies related to public intervention in these systems, IIMI and the Water and Energy Commission Secretariat of Nepal held an international conference in Kathmandu. The conference papers present recent and ongoing research, as well as agencies' experiences, on farmer-managed systems.

L.E. Small, MS. Adriano, E.D. Martin, B. Ramesh, K.S. Young, and P. Pradhan

Financing irrigation services: A literature review and selected case studies from Asia

1989. ix + 287 p. A5. Softcover. ISBN 92-9090-1027. Price US\$27.50. US\$10. (developing countries).

The result of two years' intensive research into a hitherto unexplored area of irrigation management, financing irrigation, this book provides valuable guidelines for students and organizations and all others who are interested in helping to increase food production by channeling finance in the right direction, and reducing the costs of investment. The authors have analyzed the relationships between investment costs, level of irrigation fees, cropping intensity, type of crop, and secondary income. The studies conclude that the quality

of irrigation system operation and maintenance is affected not only by the amount of resources made available to operate and maintain systems, but also by the institutional arrangements under which they are provided.

International Irrigation Management Institute

Irrigation management in Nepal: Research papers from a national seminar, Bharatpur, Nepal, 4-6 June 1987

1988. v + 138 p. B5. Softcover. Price US\$12.50. US\$7 (developing countries).

This proceedings documents the findings of 11 field studies on irrigation management conducted in Nepal since 1983. Several explore the topic of organizational structure and resource mobilization. Other topics include management of operation and maintenance in farmer- and agency-managed irrigation systems, and rapid appraisal methods for inventorying farmer- managed systems. An important book for those readers interested in the continuing development of irrigation resources in Nepal.

Senen M. Miranda

Irrigation management for crop diversification in Indonesia, the Philippines, and Sri Lanka: A synthesis of IIMI's research

1989. xvi + 103 p. B5. Softcover. ISBN 92-9090-106-3. Technical Paper Number 1. Price US\$12.50. US\$6 (developing countries).

This study of crop diversification in Indonesia, the Philippines and Sri Lanka provides conclusions and recommendations on the potentials and constraints to more intensive non-rice production during the dry season in irrigation systems that have been developed primarily for rice production. Relevant secondary data other than that from the research sites are provided to shed further insight in the synthesis.

Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) and International Irrigation Management Institute

State of the art and abstract bibliography: Water management for crop diversification in irrigated rice-based cropping systems

1988. vii + 91 p. B5. Softcover. Free on request,

Published by PCARRD, Los Baños, Laguna, The Philippines.

This publication provides a synthesis of available research information on wetland rice production, rice-based cropping systems, water management and socioeconomics of crop diversification. Also included is a collection of abstracts of literature on these subjects. The aim is to provide benchmark information to researchers, students, managers and policy makers for research planning and decision making.

Research network on irrigation management for diversified cropping in rice-based systems

1989 (November). x + 150 p. 85. Softcover. ISBN 92-9090-118-7. Price US\$17.50. US\$9.50 (developing countries).

This book reports the proceedings of an organizational and planning workshop for a research network on title subject in late 1988 in Bangkok, Thailand. In addition, eight papers on irrigating nonrice crops, and discussions of each, are included. Discussions leading to the establishment of a research network involving researchers from eight humid tropical Asian countries where irrigated rice predominates during wet season are presented in conclusion.

RESEARCH PAPERS

Research Papers publish, in a more condensed format, principal findings, especially those that seem to be of more general relevance. Such papers may be derived directly from IIMI's field-work or commissioned.

Leslie E. Small and Randolph Barker

Research priorities for irrigation management in Asia: An overview of research in irrigation management in Asia

Research Paper No 1. 1985. ii + 20 p. A4. Stapled. (out of print).

This document presents two papers that provide interpretative summaries of the discussion and summary of the workshop "Research Priorities for Irrigation Management in Asia," held at IIMI head quarters 6-11 January 1985. The first provides a conceptual framework for irrigation management research. The second summarizes the conceptual evolution of irrigation management in terms of conventional disciplinary and holistic, systems-oriented approaches.

International Irrigation Management Institute

Proceedings from the workshop on selected irrigation management Issues

Research Paper No 2. 1985. iv + 34 p. A4. Stapled. (out of print).

IIMI's second workshop brought together irrigation managers, planners, and researchers at IIMI's headquarters on 15-19 July 1985 to assess the state of knowledge in irrigation management research; the results are presented in this paper. Topics included rapid appraisal, rehabilitation, main system management and institutions.

Robert Chambers and Ian Carruthers

Rapid appraisal to Improve canal irrigation performance: Experience and options

Research Paper No 3. 1986. ii + 18 p. A4. Stapled. Binding. (out of print).

Rapid rural appraisal refers to field evaluation techniques which attempt to optimize cost effectiveness and timely completion of reports. While there is sizeable literature on RRA techniques in general, little work has been done to apply these techniques to canal irrigation. This paper investigates and reports such applications.

Douglas J. Merrey and James M. Wolf

Irrigation management in Pakistan: Four papers

Research Paper No 4. 1986. iv + 66 p. A4. Stapled. (out of print).

This collection of four papers, one by J. Wolf and three by D.J. Merrey. The first analyze operation and maintenance costs in Punjab, while the remaining three analyzes critical institutional issues, based on four years of anthropological field work.

Edward Martin and Robert Yoder

institutions for irrigation management in farmer-managed systems: Examples from the hills of Nepal

Research Paper No 5. 1987. 24 p. A4. Stapled. (out of print).

This text examines farmer organizations and property rights which have evolved as institutions in Nepal that enable collective management of water for agricultural production.

COUNTRY PAPERS

Country papers are similar to research papers, but this series contains works of relevance mainly in their country of generation. Most of IIMI's country operations will produce works of this nature, as a result of their field activities.

SRI LANKA SERIES

Namika Raby and Douglas J. Merrey

Professional management in irrigation systems: A case study of performance control in Mahaweli System H, Sri Lanka

Sri Lanka Country Paper No 1. 1989. xx + 95 p. A5. Softcover. ISBN 92-9090-119-5. Price US\$12. US\$5.50 (developing countries).

Country paper 1 presents a descriptive study on decision making in irrigation management as found in one agency in Sri Lanka. The authors have examined in detail the goals, alternatives, the formal and informal dimensions of their managerial process within the agency, and the outcome of this process. Though the study focuses on Sri Lanka, its findings are widely applicable. The results presented here are of value to professional irrigation managers in particular, and, more generally, to the broader professional and academic community working on irrigation management problems.

Merrey, Douglas J. and P.G. Somaratne

institutions under stress and people in distress: Institution-building and drought in a new settlement scheme in Sri Lanka

Sri Lanka Country Paper No 2.1989. xix + 83 p. A5. Softcover. ISBN 92-9090-112-7. Price US\$ 10. US\$5 (developing countries).

An analysis of irrigation operational problems and their institutional causes on a new irrigation system in Sri Lanka, during a disastrous drought, is presented through this study. The authors offer a number of suggestions for improving the management of the system. Opportunity to avoid problems found on older irrigation systems by paying greater attention to developing effective institutions is greater at the stage when a system is new. This study is a contribution toward achieving this objective.

C. R. Panabokke

irrigation management for crop diversification in Sri Lanka: A synthesis of current research

Sri Lanka Country Paper No. 3. 1989.60 p. A5. Softcover. ISBN 92-9090-115-2. Price US\$12.50. US\$7.50 (developing countries).

The study explores the technical and socioeconomic constraints in irrigation management for diversified cropping. Based on Sri Lanka, with more than fifteen years' experience of dry-season irrigation for diversified cropping, there remains a lack of clear understanding of both constraints and opportunities which are considered necessary for formulating future strategies and policies, and also an inadequate knowledge of proper management of irrigation systems for dry-season cropping with other food crops. The research results provide the essential first step towards identifying future management intervention approaches and proposed directions in which they could be tested and adopted.

Pamela Stanbury (assisted by Ranjinie Moragoda)

Land settlement planning issues for improved irrigation management: A case study of the Kirindi Oya irrigation and settlement project

Sri Lanka Country Paper No 4.1989.80 p. A5. Softcover. ISBN 92-9090-116-0. Price US\$13.50. US\$8 (developing countries).

An analysis of the impact of settlement policies on irrigation management in a new irrigated settlement scheme in southern Sri Lanka, based on field research in 1988. It provides policy recommendations for improvements on this scheme and in future schemes.

NEPAL SERIES

Prachandra Pradhan

Patterns of irrigation Organization in Nepal: a Comparative Study of 21 Farmer-managed Irrigation Systems

Nepal Country Paper No 1. 1990. xvi + 122 p. A5. Softcover. ISBN 92-9090-109-8. Price US\$11.50. US\$6 (developing countries).

The study identifies and describes the types of irrigation organizations that can be found in farmer-managed systems, and examines the factors that stimulate farmers to organize for irrigation activities. Experience in farmer-managed systems also suggests that certain

management principles can be applied to government-managed systems for improved performance. These aspects and key issues relevant to government policy for intervention and the formulation of development strategy are also examined. The study concludes that even weak physical structures can be compensated for, by strong and disciplined irrigation organizations.

Prachandra Pradhan

increasing Agricultural Production in Nepal

Nepal Country Paper No 2.1990. xiv + 59 p. A5. Softcover. ISBN 92-9020-142-X. Price US\$8. US\$4 (developing countries).

The author contends that Nepal irrigation policy directives and resources must be channeled to encourage the participation of beneficiaries and to focus the functions of the Irrigation Department on a management perspective. Three low cost approaches to this are presented: incorporating farmer participation in operation and management, considering lower cost structures in surface and ground-water irrigation, and improving the management of irrigation.

PAKISTAN SERIES

Robert Johnson

Private tube well development in Pakistan's Punjab: A review of past programs/policies and relevant research

Pakistan Country Paper No 1. 1989. ix + 24 p. AS. Stapled. ISBN 92-9090-151 -9. Price US\$10. US\$6. (developing countries)

Although Pakistan's surface irrigation development has a long history, the development of groundwater began only about 30 years ago. During the past decade, government policy has been reoriented towards private, instead of public tube wells. This paper examines the policies that have affected tube well development and reviews past literature on the subject.

J.W. Kijne

irrigation management in relation to waterlogging and salinity: Precis for a research agenda in Pakistan

Pakistan Country Paper No 2. 1989. vii + 13 p. AS. Stapled. ISBN 92-9090-151 -9. Price US\$6.50. US\$4.50. (developing countries).

This paper presents an overview of the current state of knowledge on the relationship between irrigation management in Pakistan and the incidence of waterlogging and salinity. Key management questions are also highlighted.

E.J.V. Vander Velde

irrigation management in Pakistan mountain environments

Pakistan Country Paper No 3. 1989. xiii + 33 p. A5. Stapled. ISBN 92-9090-153-5. Price US\$8.50. US\$5.75. (developing countries).

This paper is a first step in defining the extent of irrigation in Pakistan's mountain regions. Attention is given to some changes already begun in this environment through new irrigation development activities. Important knowledge gaps are also identified.

OCCASIONAL PAPERS

Douglas J. Merrey, P.S. Rao and Edward D. Martin

Irrigation management research in Sri Lanka: A review of selected literature

Occasional Paper No 1. 1988. 52 p. A4. Stapled. Price US\$7.50. US\$4.50. (developing countries).

This paper reviews literature in four topic areas—system operation and performance, organization and management of irrigation systems, rehabilitation, and resource mobilization—of relevance to Sri Lanka. The review includes discussion of progress to date and lessons learned in each of the four areas.

Robert Yoder, Prachandra Pradhan, and Edward D. Martin

Recommendations for consideration in the development of Nepal's irrigation master plan

Occasional Paper No. 2. 1988. 15 p. A4. Stapled. Price US\$4.50. US\$2.75. (developing countries).

Recommendations presented in this paper were initially discussed at an Irrigation Sector Coordination Meeting held in Kathmandu on 23 February 1988 and convened by the Ministry of Water Resources. Topics included ways to improve the effectiveness of operation and maintenance of agency-managed systems, and the efficiency of assistance to farmer-managed systems.

CASE STUDIES

Honorio B. Bautista

Experiences with organizing irrigators associations: A case study from the Magat River irrigation project in the Philippines

Case Study No 1. 1980. 40 p. A4. Stapled. (out of print).

A. M. S. Gunadasa

An approach to improved systems management: A case study of the Kimbuiwana Oya irrigation scheme

Case Study Series No 2. 1989. 48 p. A4. Stapled. ISBN 92-9090-111-X. Price US\$5. US\$2.50 (developing countries).

This case study describes the problems that existed in a Sri Lankan irrigation scheme prior to its rehabilitation in 1979, and the associated irrigation management innovations introduced by the author who was assigned to the scheme. These included providing a simplified form of technical guidance to farmers and using organized farmer participation in the operation and maintenance of the system through a Water Issue Board. By gaining the confidence of the farmers and the various line agencies working in the area, the author was able to introduce a systematic rotational distribution of water, advance the cultivation calendar, and increase cropping intensity.

P. Weerakkody

A participative approach for improved water management

Case Study Series No 3. 1989. xvi + 16 p. A4. Stapled. ISBN 92-9090-113-6. Price US\$6. US\$3 (developing countries).

This case study reports the author's experience with the institutional and irrigation infrastructure of System H of the Mahaweli Multipurpose Development Project in Sri Lanka. A coordinated approach for achieving close cooperation between agency officials and farmers at the field channel and distributary channel levels, combined with a flexible delivery schedule, has resulted in an improved field water use efficiency within the subsystem H5. An equitable allocation of water to each field channel command area and an effective utilization of rainfall has also been achieved.

WORKING PAPERS

The Institute publishes a series of Working Papers (13 issued to date) on a variety of research topics for which the institute wishes to stimulate discussion. Working Papers are distributed at the author's discretion and may be obtained by writing to the author or authors through the Information Office, IIMI's headquarters.

Senarath Bulankulame

Social aspects of water management during the maha season 1985/86 in Dewahuwa and Mahaweli H-2 Block 305: Precept and practice

Working Paper No 1. (out of print). 1986. ii + 28 p. A4. Mimeo.

Douglas Vermillion

Turning over irrigation systems from the Government of Indonesia to farmers

Working Paper No 2. (out of print). 1987. 25 p. A4. Size. Mimeo.

Ratnasiri Ekanayake and David Groenfeldt

Organizational aspects of irrigation management at Dewahuwa Tank during yala 1986

Working Paper No 3. (out of print). 1987. ii + 35 p. A4. Mimeo.

Mark Svendsen

Sustainability in irrigated agriculture

Working Paper No 4. (out of print; also available in Volume 2 Number 2 of IIMI Review). 1988. 12 p. A4. Mimeo.

Pamela Stanbury

Land settlement planning issues in irrigation management: A review of experiences in Sri Lanka

Working Paper No 5. (out of print). 1988. ii + 34 p. A4. Mimeo.

David Groenfeldt, Joe Alwis and Jayantha Perera

Strategies for improving minor Irrigation systems in Sri Lanka

Working Paper No 6. (out of print). 1988. ii + 40 p. A4. Mimeo.

Douglas J. Merrey and K. Jinapala

On physical remodeling and institution strengthening: An evaluation of the implications of the pilot field channel experience for the rehabilitation project at Uda Walawe, Sri Lanka

Working Paper No 7. (out of print). 1988. ii + 15 p. A4. Mimeo.

Robert Hecht

Land and water rights and the design of small-scale irrigation projects: The case of Baluchistan

Working Paper No 8. (out of print). 1988. 16 p. A4. Mimeo.

Daniel Berthery, Hilmy Sally, and Jayantha Arumugam

Mathematical modeling of irrigation canal systems. Part I: Presentation of the 'Mistral-Simutra' software package. Part II: Application of 'Mistral- Simutra' to the Kalankuttiya branch canal (Mahawell system H), Sri Lanka

Working Paper No 9. 1989. vi + 72 p. A4. Mimeo.

Hilmy Sally, Daniel Berthery, Frederic Certain and Andre Durbec

Calibration of the Kirindi Oya RBMC mathematical flow simulation model: Description of the field measurement campaign and preliminary results

Working Paper No 10.1989.25 p. A4. Mimeo.

Ranjanie Moragoda and David Groenfeldt

Organizational aspects of Irrigation management in Kalankuttiya Block, Mahawell System H, Sri Lanka during the 1986 Dry Season

Working Paper No 11. 1989. iv + 30 p. A4. Mimeo.

Naresh C Pradhan and Robert Yoder

improving irrigation system management through farmer-to-farmer training: Examples from Nepal

Working Paper No 12. 1989. iii + 15 p. A4. Mimeo.

Prachandra Pradhan

Irrigation development in Bhutan

Working Paper No 13. 1989. vii + 17 p. A4. Mimeo.

ACIAR

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Monographs

D.J. Boland

Trees for the Tropics: Growing Australian Multipurpose Trees and Shrubs in Developing Countries. ACIAR Monograph No. 10

1989. 247 p. Price \$A42.00 (including postage and handling).

This book describes the first four years of a group of four ACIAR forestry projects, which operated in Australia, China, Kenya, Thailand and Zimbabwe. It provides a history of the initiation and development of the projects and describes project activities—seed collection of lesser-known Australian species, species elimination and evaluation trials, climatic matching, fodder assessment, essential leaf oils, fuelwood studies, termite studies, and nutrition. The book contains results to date and evaluates these in terms of utilising Australia's lesser-known trees and shrubs for developing countries. A list of publications pertaining to ACIAR forestry projects is also included.

M.B. Peoples, A.W. Faizah, B. Rerkasem, and D.F. Herridge

Methods for evaluating nitrogen fixation by nodulated legumes in the field. ACIAR Monograph No. 11

1989. vii + 76 p, Price \$27.00 (including postage and handling).

This handbook describes simple, reliable methods of measuring nitrogen fixation that have emerged from ACIAR-funded research. It is intended for use by developing country scientists who desire a better understanding of the role of nitrogen fixation in cropping systems. Biological nitrogen fixation by food and forage legumes can add significant amounts of nitrogen to the soil for use by companion or subsequent cereal crops. It is hoped that this cheaper alternative to nitrogen fertilizers can be better utilised by resource-poor farmers, who are the ultimate clients of technologies emerging from the research that ACIAR supports.

D.F. Waterhouse and K.R. Norris

Biological control: Pacific prospects—Supplement 1. ACIAR Monograph No. 12

1989. vii +125 p. Price \$41.00 (including postage and handling).

Biological Control: Pacific Prospects was published in 1987 by Inkata Press, from material collected under ACIAR's South Pacific program. This supplement has arisen in response to requests for data on

additional pests, and the six pests documented were chosen following recommendations made at Plant Protection meetings held in Apia in 1986 and Noumea in 1987. Dossiers in the Supplement follow closely the format adopted in *Biological Control: Pacific Prospects*, whereby each pest is discussed in relation to biological and ecological information pertinent to successful biological control. The information presented emphasises the southwest Pacific region and discussion is intended to have relevance to that region's traditional and other agriculturists.

E.T. Craswell and E. Pushparajah

**Management of acid soils in the humid tropics of Asia.
ACIAR Monograph No. 13 (IBSRAM Monograph No. 1)**

1989. x + 118 p. Price \$25.00 (including postage and handling).

This is a joint publication of ACIAR and the International Board for Soil Research and Management (IBSRAM). It stems from a workshop held in Kuala Lumpur in early 1989. The papers cover the current research on the management of the acid infertile soils -the Oxisols and Ultisols - which dominate the humid tropics of Asia. There are also descriptions of the technological solutions emerging from research into problems of acid soils, and of the ASIALAND-Management of Acid Soils Network initiated at the workshop to foster a more cohesive approach to solving the difficulties facing smallholders in Asia.

Technical reports

J.R. Freney, J.R. Simpson, Zhu Zhao-Liang, and Aziz Bidin

Gaseous nitrogen loss from urea fertilizers in Asian cropping systems. ACIAR Technical Reports No. 9

1989. 16 p. Price \$A9.50 (including postage and handling).

Nitrogen supply is a major yield constraint to food crops in Asia, especially for rice. Urea is used extensively as a nitrogen fertilizer on rice paddies, but the method of application can lead to nitrogen losses of 30-90 per cent. An ACIAR project to address this problem involved linking scientists from the CSIRO Division of Plant Industry in Australia with their counterparts at research institutes in China and Malaysia. This technical report outlines the work done and the results obtained.

G.J. Ryland and K.M. Menz

**Bulk handling of paddy and rice in Malaysia:
an economic analysis. ACIAR Technical Reports No. 10**

1989. 32 p. Price \$A12.50 (including postage and handling).

ACIAR has supported a number of projects on postharvest handling of grains in Southeast Asia. This report details an economic study of the industry which was based on the premise that new technology will only be adopted when there are appropriate economic incentives. Researchers found that such incentives are presently lacking in the postharvest rice sector in Malaysia, especially in the grain-drying stage. The report gives guidelines for policy changes which will be necessary to improve technology adoption, and suggests suitable incentives to generate the necessary stimulus.

K.M. Menz and E.M. Fleming

**Economic prospects for vanilla In the South Pacific.
ACIAR Technical Reports No. 11**

1989. 14 p. Price \$A9.50 (including postage and handling).

ACIAR's interest in vanilla arose during a project on smallholder farming systems in the Kingdom of Tonga. Vanilla was noted as a suitable crop for smallholder farmers with a ready world market. However, information on the vanilla industry in the South Pacific was not readily available. This report was prepared to overcome this deficiency. Of special interest is the analysis of factors underpinning the world market for vanilla, and the effects of price changes on the future profitability of vanilla production in the South Pacific. Vanilla is also used as a case study to identify other crops suitable for the South Pacific in terms of their production, processing and market characteristics.

J.A. Doeleman

**Biological control of *Salvinia molesta* in Sri Lanka:
an assessment of costs and benefits. ACIAR Technical
Reports No. 12**

1989. 14 p. Price \$A9.50 (including postage and handling).

This report details a study undertaken to estimate the value of the Sri Lankan program of biological control of the water weeds *salvinia*. The program was sponsored in Sri Lanka through an ACIAR project, using Australian research expertise gained through similar programs in Australia and Papua New Guinea. The study details the costs

incurred by the invasion of the weed and estimates the benefits brought about through its control. The benefits of control are costed over 25 years and matched against the implementation costs of the biological control program.

K.M. Menz (ed.)

Rainfed rice production in the Philippines: a combined agronomic/economic study in Antique Province. ACIAR Technical Report No. 13

1989. 90 p. Price \$30.00 (including postage and handling).

This report contains details of two ACIAR projects—an agronomic project designed to study the environmental constraints to increased productivity of rainfed rice-based farming systems in the lowland and upland areas of Sri Lanka and the Philippines, and an economic project focusing on the factors responsible for the difference between potential productivity and actual farm performance. Initial findings were presented at a workshop in the Philippines in 1987, and abstracts of the papers were published as ACIAR Technical Report No. 8. Subsequent to the workshop, analysis of the data continued and expanded versions of the Philippines papers constitute the body of this report. The Sri Lankan component, to be published separately, is currently in press.

K.J. Scott and G. Atkinson

Transport of vegetables in Papua New Guinea. ACIAR Technical Reports No. 14

1989. 28 p. Price \$15.00 (includes postage and handling).

ACIAR has supported a project studying postharvest transport of fresh fruit and vegetables in Papua New Guinea that has demonstrated ways to deliver fresh produce from the Highlands to distant main markets in good condition. A regular containerised transport system is on trial, and studies are now underway to explore possibilities for improving transport within and between other Pacific islands. The report contains a description of the project, an economic analysis of the different systems for vegetable transportation in Papua New Guinea, and some results of research concerned with conditions for storage and transport of vegetables. This information will assist all who are concerned with the problems of moving fresh produce to distant markets.

Grant Vinning

Marketing perspectives on a potential Pacific spice industry. ACIAR Technical Reports No. 15

1990. 60 p. Price \$20.00 (includes postage and handling).

The scarcity of information on spices became apparent during an ACIAR study on the economics of vanilla production. This publication is designed to assist others interested in spices in the South Pacific, and save them seeking out data from difficult sources. Spices have been heralded as an area of opportunity for South Pacific agriculture, and this material should prove invaluable to South Pacific policy-makers and entrepreneurs in making decisions for the benefit of the region.

Proceedings

H. Campbell, K. Menz, and G. Waugh

Economics of fishery management in the Pacific islands region: proceedings of an international conference held at Hobart, Tasmania, Australia, 20-22 March 1989. ACiAR Proceedings No. 26

1989. 169 p. Price \$36.00 (including postage and handling).

These are the proceedings of a conference held to assess the need for economic research into increasing fisheries productivity for island nations in the South Pacific region. A number of these nations explained their priorities in fisheries development, and revealed needs for different types of economic assistance for their fishing industries. The proceedings contain an economic overview of Pacific Islands fishery resource management, and also presentations on the tuna industry in the Pacific, property rights over marine resources, the prospects for inshore fisheries, aspects of marketing, management and development of fisheries, and a framework for a research and development strategy.

J.W. Turnbull

Tropical tree seed research: proceedings of an international workshop held at the Forestry Training Centre, Gympie, Qld, Australia, 21 -24 August 1989. ACiAR Proceedings No. 28

1990. 156 p. Price \$32.00 (includes postage and handling).

These proceedings arise from a workshop held under the auspices of the International Union of Forest Research Organisations (IUFRO) where scientists focused on the seed problems of multipurpose trees. The demand for high quality multipurpose tree and shrub seed cannot be met at present, and the detrimental consequences of using poor seed can be major and long-term. Topics covered at the workshop included Seed biology, seed testing, seed processing and storage, and overviews of the forest seed situation in various countries. Recommendations arising from the workshop include a standard procedure for evaluating new species and a regime for approaching tree seed storage in practical and economic ways.

Acquisition of publications

ACIAR publications can be purchased direct from the Centre's sales agent, Inkata Press Pty Ltd, at 13/170 Forster Road, Mt Waverley, Victoria 3149, Australia. ACIAR gives sympathetic consideration to requests from developing countries for complimentary copies. Such requests should be sent to the Communications Coordinator, ACIAR, GPO Box 1571, Canberra ACT 2601, Australia.

FFTC/ASPAC

**Food and Fertilizer Technology Center for the
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F.F.T.C. Book Series

F.F.T.C. is an international agricultural information center, funded by the governments of the China, Korea and Japan. The Center was established in 1970 to assist in the development of agriculture in the Asian and Pacific region by promoting the exchange and dissemination of information. We are particularly concerned with technology suitable for small farms in the region, and distribute over 50,000 free Bulletins every year as well as books. The books listed below have been distributed free of charge to agricultural libraries in the Asian and Pacific region, and in developing countries outside the region.

The prices listed below are slightly above cost, and include packing and airmail postage. Any profits are unintentional, and will be used to further our free publications program for the developing world. All books are soft cover, typeset on good quality paper. 260 X 190 mm.

Food and Fertilizer Technology Center for the Asian and Pacific Region

The Breeding of Horticultural Crops

1987. 273 pp. 19 x 26 cm. Paperback. ISSN 0253-9616. Price (incl. airmail postage) US \$10.00.

This book is the Proceedings of an international symposium on Horticultural Breeding, held at National Chung Hsing University, China in December 1986. It brings together some of the most recent research being carried out in the Asian and Pacific region on the breeding of horticultural crops-vegetables, fruit and ornamental plants-and describes some of the plant breeding programs now in progress.

The breeding of improved varieties is a vital aspect of modern small farm agriculture. It is always the small-scale farmer who finds it most difficult to overcome the constraints of his environment to produce good crops. He often cannot afford the irrigation system, the chemical fertilizers and soil amendments, the pesticides, that can create favorable growing conditions in almost any soil. What he needs are varieties adapted to his particular needs, which can use available inputs under local conditions to give him a marketable crop which gives him a good return for his efforts. We hope this volume will be of value to all those engaged in the vital task of creating improved horticultural crop varieties for the farmers of this region.

Food and Fertilizer Technology Center for the Asian and Pacific Region

Improved Vegetable Production in Asia

1987. 207 pp. 19 x 26 cm. Paperback. ISSN 0253-9616. Price (incl. airmail postage) US \$10.00.

This book, the Proceedings of an international seminar of the same name which was held in Thailand, is concerned with recent improvements in vegetable production technology. Vegetable production is one of the most promising ways in which small-scale farmers can earn higher incomes, while at the same time improving the diet of their countrymen. The recent surplus of staple food crops in many Asian countries makes it all the more important to help farmers produce a more diverse range of higher value crops. Most small-scale farmers in Asia live in the tropics and subtropics. If they are to improve their vegetable production, they need to be able to choose from a large number of hardy varieties which are heat and disease resistant. They also need to know about production methods suitable for small-scale farmers with limited capital to invest. This book describes the breeding of new vegetable varieties, the development of improved cultural methods, and also recent work on the processing and marketing which are such a vital aspect of small farm development.

Food and Fertilizer Technology Center for the Asian and Pacific Region

Postharvest Handling of Tropical and Subtropical Fruit Crops

1988. 136 pp. 19 x 26 cm. Paperback. ISSN 0253-9619. Price (incl. airmail postage) US \$10.00.

Postharvest losses are a problem in small-scale agriculture everywhere, but are particularly serious in the case of fruit production, particularly the delicate fruit of the tropics and subtropics. Although the market prospects for such fruit are good in both domestic markets and overseas, an estimated 25% of fruit produced in Asian countries is lost because of faulty handling and storage. Better postharvest handling procedures would make this enormous volume of produce available on the market, to provide higher incomes for farmers and quality foods for consumers.

This book is the Proceedings of an international seminar held in Taiwan, China in November 1987. The papers give the results of a great deal of recent research on such topics as chemical treatments, control of thermal stress, packaging techniques and storage methods. Some very useful papers give general information on the extent and causes of postharvest losses of fruit, and ways in which countries

can develop practical and efficient postharvest handling systems to suit their particular needs. Several authors emphasize the variation between species, and between different varieties of the same species, in response to particular handling procedures. Some varieties, for example, may respond well to cold storage or heat treatment, while fruit of very similar varieties may be ruined by exactly the same treatment. Of course this does not mean that successful technology cannot be transferred to new species, but it does mean that careful testing is needed.

Fruit production is already making a substantial contribution to the incomes of millions of small-scale farmers in the Asian and Pacific region, and the future outlook is very promising. Given the difficulty of efficient postharvest handling procedures on small farms in the tropics and subtropics, especially when these are widely scattered and lie a long way from markets and ports, it is encouraging that there has been so much successful research and development in recent years. We hope that his book will be helpful to all those who are working to improve the market quality of fruit harvested in the Asian and Pacific region.

Food and Fertilizer Technology Center for the Asian and Pacific Region

The Use of Cell and Tissue Culture for Field Crop Improvement

1988. 149 pp. 19 x 26 cm. Paperback. ISSN 0253-9619. Price (incl. airmail postage) US \$10.00.

The use of cell and tissue culture for the identification and selection of useful variants at a cellular level has become one of the most powerful tools in modern plant breeding. Already some varieties and lines of major food crops which have been bred using these techniques are being released to farmers. This book is the Proceedings of the international seminar "Cell and Tissue Culture in Field Crop Improvement", sponsored by our center, and by the National Institute of Agrobiological Resources and the Food and Agriculture Research and Development Association of Japan.

The breeding of improved varieties is one of the most effective ways to help the small-scale farmer achieve higher and more stable yields. Not only do improved varieties make more efficient use of soil nutrients, they are often more resistant to disease, and give effective disease control without any increase in inputs such as chemical pesticides. Cell and tissue culture is likely to prove of great benefit, therefore, to farmers who cannot afford heavy investment into farm inputs, and who must make intensive use of a small area of land. The papers in this Proceedings bring together recent research by tissue culture specialist from the Asian and Pacific region and the United

States. They cover such important topics as the in vitro selection of resistant cells which can be regenerated into resistant plants, the use of haploidy, embryo culture, and the production of hybrids by protoplast fusion.

In view of the rapid progress of research in this field, and the important practical implications of this research, there seems no doubt that cell and tissue culture will play a major role in the future development of crop production in the Asian Pacific region. We hope that this book will make a useful contribution to the work of those who are already engaged in cell and tissue culture, and will also be of value to those who are now preparing to incorporate these techniques for the first time into their national plant breeding programs.

Food and Fertilizer Technology Center for the Asian and Pacific Region

Classification and Management of Rice Growing Soils

1989. 118 pp. 19 x 26 cm. Paperback. ISBN 957-9539-00-6. Price (incl. airmail postage) US \$10.00.

Rice is the staple crop in Asia, where soils have been cultivated for rice for more than three thousand years. Since rice grows best in standing water, wherever possible fields producing rice are leveled and flooded. Pudding is also carried out, to reduce the permeability of the soil.

This book contains a selection of papers from an international workshop concerned with the classification and management of rice growing soils, and with the off-season utilization of rice lands. The transition from the puddled and reduced state of the soil required by rice to the well aerated and structured soil required by most upland crops has created problems for both types of use. These problems are related to soil management, soil fertility, pest and disease control, and a range of scale-economic factors. Since the Workshop was perhaps the first of its kind to address these problems, this book will be useful to all those concerned with improving the productivity of rice soils, with reference to both rice itself and off-season upland crops.

Food and Fertilizer Technology Center for the Asian and Pacific Region

Biological Control: The Use of Parasitoids and Predators to Control Agricultural Pests

1990. 248 pp. 19 x 26 cm. Paperback. ISBN 957-9539-00-6. Price (incl. airmail postage) US \$12.00.

There is now a growing interest in the control of agricultural pests by natural enemies as an alternative or supplement to chemical control. Although chemical pesticides are often very effective, they cause problems of toxic residues environmental pollution and the development of resistance in pests. Papers in this Proceedings discuss problems of biological control, including the difficulty of combining the use of natural enemies of pests with the use of pesticides. Various ways are suggested in which pesticide damage to natural enemies can be prevented or minimized. Most of the successes in the use of natural enemies to control agricultural pests have been in the situation where an introduced pest is controlled by an introduced predator or parasitoid. If the natural enemy is indigenous, it is usually necessary to raise the population of natural enemies artificially, by mass production in the laboratory. Several papers describe diets and techniques for the mass rearing of natural enemies, including that of hosts for egg parasitoids.

