

Cambridge University Press & Assessment

978-0-521-17087-1 – Biodiversity in Agriculture: Domestication, Evolution, and Sustainability

Edited by Paul Gepts, Thomas R. Famula, Robert L. Bettinger,

Stephen B. Brush, Ardeshir B. Damania, Patrick E. McGuire, Calvin O. Qualset

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Biodiversity in Agriculture

Domestication, Evolution, and Sustainability

The introduction of plant and animal agriculture represents one of the most important milestones in human evolution. It contributed to the development of cities, alphabets, new technologies, and – ultimately – to civilizations, but it has also presented a threat to both human health and the environment.

Bringing together research from a range of fields including anthropology, archaeology, ecology, economics, entomology, ethnobiology, genetics, and geography, this book addresses key questions relating to agriculture. Why did agriculture develop, and where did it originate? What are the patterns of domestication for plants and animals? How did agroecosystems originate and spread from their locations of origin? Exploring the cultural aspects of the development of agricultural ecosystems, the book also highlights how these topics can be applied to our understanding of contemporary agriculture, its long-term sustainability, the co-existence of agriculture and the environment, and the development of new crops and varieties.

Paul Gepts is Professor of Plant Sciences at the University of California, Davis.

Thomas R. Famula is Professor of Animal Science at the University of California, Davis.

Robert L. Bettinger is a Professor in the Department of Anthropology, University of California, Davis.

Stephen B. Brush is Professor Emeritus in the Department of Human and Community Development, University of California, Davis.

Ardeshir B. Damania is an Associate in the Agricultural Experiment Station, Department of Plant Sciences, University of California, Davis.

Patrick E. McGuire is Academic Coordinator in the Department of Plant Sciences, University of California, Davis.

Calvin O. Qualset is Professor Emeritus in the Department of Plant Sciences, University of California, Davis.

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University of California, Davis, USA



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Foreword

Bruce D. Smith

This landmark volume eloquently underscores the enduring legacy of Jack Harlan's broad-ranging and multiple-perspective approach to considering the past development and future challenges of agricultural economies, world-wide. It also highlights the remarkable degree to which plant and animal domestication and agricultural origins continue to expand as a general research question across a wide spectrum of different disciplines in the biological and social sciences.

General areas of inquiry are continually emerging in science, and for widely varying periods of time, they attract and reward researchers, providing interesting and unfolding sequences of questions before eventually closing down as their research potential is exhausted. The evolution of agricultural economies, from first origins to future developments, is an excellent example of an extremely long-lived problem area which not only has witnessed substantial growth since the pioneering efforts of Vavilov, Braidwood, Harlan, Heiser, MacNeish, and others, but also holds the very real promise of continuing to expand and provide new research questions for generations to come.

Many of the reasons for this continued expansion of interest and research are obvious. Initial domestication and the subsequent development of agricultural economies was not a single isolated event, for example, but rather occurred in perhaps a dozen different world regions or more, as our distant ancestors independently domesticated a wide variety of different species at different times and in different temporal sequences, providing a rich set of complex regional-scale developmental puzzles for comparative analysis. The subsequent diffusion of domesticates and agricultural economies out of these centers of agricultural origin add to the set of regional-scale comparative examples available for study, with almost every world area experiencing the eventual transition from hunting and gathering to food production economies.

Along with offering complex regional-scale developmental puzzles world-wide, the general research topic of agricultural origins also encompasses the domestication of a rich variety of plants and animals. Each of these in turn provides another complex set of interrelated questions at the species level of analysis for both archaeologists and geneticists: where and when and from which wild progenitor population did different domesticates develop, and in what kinds of environmental and cultural contexts? The past decade in particular has witnessed remarkable advances in our understanding of the early history of a rapidly expanding list of domesticated plants and animals.

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Along with establishing clear and lasting templates for how to approach domestication and agricultural origins at both the regional and species levels of analysis, focusing on sub-Saharan Africa and its crop plants, Jack Harlan also framed the central issues involved in the larger-scale comparative analysis of different centers (and noncenters) of domestication. In a series of classic papers, Harlan and colleagues also illuminated the cause and effect of evolutionary relationships at work during the initial domestication of seed plants; how human planting and harvesting of stored seed stock created new sets of selective pressures, with the resultant automatic adaptive response of the cultivated plant populations reflected in the genetic and morphological changes identified today under the general heading of the *adaptive syndrome of domestication*.

Jack Harlan clearly recognized that as a general area of inquiry, *agricultural origins and evolution* encompasses a vast landscape of different research questions and calls for sustained communication and collaboration between researchers in many different disciplines. The Harlan II Symposium, and the rich variety of cross-illuminating perspectives that are represented in this volume, reflect the enduring importance of such scholarly interaction, as well as the continuing expansion of interest in this fascinating and rewarding topic.

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Contributors

Ogonazar Aknazarov

Desert Research Institute, Khorog, Gorno-Badakhshan Autonomous Oblast, Tajikistan

M. Kat Anderson

USDA-Natural Resources Conservation Service, National Plant Data Center, c/o Department of Plant Sciences, University of California, Davis CA USA

Leif Andersson

Department of Medical Biochemistry and Microbiology, Uppsala University and Department of Animal Breeding and Genetics, Swedish University of Agricultural Sciences, Uppsala, Sweden

C.W. Bamforth

Dept. of Food Science and Technology, University of California, Davis CA USA

Ofer Bar-Yosef

Department of Anthropology, Harvard University, Boston MA USA

Peter Bellwood

School of Archaeology and Anthropology, Australian National University, Canberra ACT Australia

Robert L. Bettinger

Department of Anthropology, University of California, Davis CA USA

Aline Borges

Genetics Department, Luiz de Queiroz College of Agriculture, São Paulo University, Piracicaba, SP, Brazil

Eduardo A. Bressan

Agriculture Nuclear Energy Center, São Paulo University, Piracicaba, SP, Brazil

Stephen B. Brush

Department of Human and Community Development, University of California,
Davis CA USA

David Cavagnavo

Seed Savers Exchange, Decorah IA USA

M.I. Chacón S.

Facultad de Agronomía, Universidad Nacional de Colombia, Bogotá, Colombia

Loren Cordain

Department of Health and Exercise Science, Colorado State University, Fort
Collins CO USA

Ardeshir B. Damania

Department of Plant Sciences, University of California, Davis CA USA

D.G. Debouck

Genetic Resources Unit, International Center for Tropical Agriculture (CIAT),
Cali, Colombia

Jared Diamond

Department of Geography, University of California, Los Angeles CA USA

A. Duputié

Centre d'Ecologie Fonctionnelle et Evolutive, Montpellier, France and Section of
Integrative Biology, University of Texas at Austin, Austin TX USA

M. Elias

Centro de Investigação em Biodiversidade e Recursos Genéticos (CIBIO-UP),
Campus Agrário de Vairão, Vairão, Portugal

Thomas R. Famula

Department of Animal Science, University of California, Davis CA USA

Dorian Q. Fuller

Institute of Archaeology, University College London, London, UK

Paul Gepts

Department of Plant Sciences, University of California, Davis CA USA

C.L. Laxmipathi Gowda

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT),
Patancheru, Andhra Pradesh, India

Melissa M. Gray

Department of Ecology and Evolutionary Biology, University of California,
Los Angeles CA USA

David R. Harris

Institute of Archaeology, University College London, London, UK

Dennis Hedgecock

Department of Biological Sciences, University of Southern California, Los
Angeles CA USA

Matthew S. Hickey

Department of Health and Exercise Science, Colorado State University, Fort
Collins CO USA

Tai Johnson

Department of History, University of Arizona, Tucson AZ USA

Hui Jiang

Bratnell Lab, Boyce Thompson Institute for Plant Research, Ithaca NY USA

Karim-Aly Kassam

Department of Natural Resources, Cornell University, Ithaca NY USA

Shawn Kelly

Parametrics Inc., Albuquerque NM USA

Kami Kim

Departments of Medicine and of Microbiology and Immunology, Albert Einstein
College of Medicine, Bronx NY USA

Michael J. Kovach

Department of Plant Breeding and Genetics, Cornell University, Ithaca NY USA

James Lapsley

Dept. of Viticulture and Enology and the Agricultural Issues Center, University of
California, Davis CA USA

Deborah Lawrence

Department of Environmental Science, University of Virginia, Charlottesville VA USA

Roger R.B. Leakey

Agroforestry and Novel Crops Unit, School of Marine and Tropical Biology,
James Cook University, Cairns, Queensland, Australia

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Edited by Paul Gepts, Thomas R. Famula, Robert L. Bettinger,

Stephen B. Brush, Ardeshir B. Damania, Patrick E. McGuire, Calvin O. Qualset

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List of contributors

Susan R. McCouch

Department of Plant Breeding and Genetics, Cornell University, Ithaca NY USA

Patrick E. McGuire

Department of Plant Sciences, University of California, Davis CA USA

D.B. McKey

Centre d'Ecologie Fonctionnelle et Evolutive, Montpellier, France and Université Montpellier II, Place Eugène Bataillon, Montpellier, France

Juan F. Medrano

Department of Animal Science, University of California, Davis CA USA

Lin Chau Ming

Horticulture Sector, Agronomical Sciences College, São Paulo State University, Botucatu, SP, Brazil

Laurie Monti

The Christensen Fund, San Francisco CA USA

J.R. Motta-Aldana

Escuela de Biología, Universidad Industrial de Santander, Bucaramanga, Colombia

Gary Paul Nabhan

Southwest Center, University of Arizona, Tucson AZ USA

Kayo J.C. Pereira

Genetics Department, Luiz de Queiroz College of Agriculture, São Paulo University, Piracicaba, SP, Brazil

Dolores R. Piperno

Department of Anthropology, The Program in Human Ecology and Archaeobiology, National Museum of Natural History, Washington DC USA and Smithsonian Tropical Research Institute, Balboa, Republic of Panama

B. Pujol

Laboratoire Evolution et Diversité Biologique, Université Paul Sabatier, Toulouse, France

Calvin O. Qualset

Department of Plant Sciences, University of California, Davis CA USA

Jurema R. Queiroz-Silva

Genetics Department, Luiz de Queiroz College of Agriculture, São Paulo University, Piracicaba, SP, Brazil

Gustavo H. Recchia

Genetics Department, Luiz de Queiroz College of Agriculture, São Paulo University, Piracicaba, SP, Brazil

Jan Salick

William L. Brown Center, Missouri Botanical Garden, St Louis MO USA

K.B. Saxena

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Andhra Pradesh, India

Ferrell Sekacucu

Second Mesa, CDP, Hopi Reservation, Navajo County AZ USA (deceased)

Mande Semon

Africa Rice Center (AfricaRice), Cotonou, Benin

M.L. Serrano S.

Escuela de Biología, Universidad Industrial de Santander, Bucaramanga, Colombia

S.N. Silim

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

Marcos V.B.M. Siqueira

Genetics Department, Luiz de Queiroz College of Agriculture, São Paulo University, Piracicaba, SP, Brazil

Bruce D. Smith

The Program in Human Ecology and Archaeobiology, National Museum of Natural History, Smithsonian Institution, Washington DC USA

R.K. Srivastava

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Andhra Pradesh, India

Megan Sweeney

Department of Plant Sciences, University of Arizona, Tucson AZ USA

Robbin W. Thorp

Department of Entomology, University of California, Davis CA USA

B.L. Turner II

School of Geographical Sciences and School of Sustainability, Arizona State University, Tempe AZ USA

H.D. Upadhyaya

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, Andhra Pradesh, India

Elizabeth A. Veasey

Genetics Department, Luiz de Queiroz College of Agriculture, São Paulo University, Piracicaba, SP, Brazil

Bridgett M. vonHoldt

Department of Ecology and Evolutionary Biology, University of California, Los Angeles CA USA

Robert K. Wayne

Department of Ecology and Evolutionary Biology, University of California, Los Angeles CA USA

George Willcox

Archéorient, CNRS, Jalès, Berrias, France

Ken Wilson

The Christensen Fund, San Francisco CA USA

Eric Wohlgemuth

Far Western Anthropological Research Group, Inc., Davis CA USA

Melinda A. Zeder

The Program in Human Ecology and Archaeobiology, National Museum of Natural History, Smithsonian Institution, Washington DC USA

Karl S. Zimmerer

Department of Geography, Pennsylvania State University, State College PA USA

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