

Teaching Sustainability in Agriculture: Resources for Instructors

Suggested Reading for Instructors (see Print Resources for annotations and URLs)

Altieri, M.A., and C.A. Francis 1992. *Commentary: Incorporating agroecology into the conventional agricultural curriculum. American Journal of Alternative Agriculture* 7 (1, 2).

Bawden, Richard J., Lawrence Busch, and Arsenio O. Gagni. 1991. The agricultural university for the 21st century. Article prepared for the World Conference on Education for all (WCEFA), Jomtien, Thailand, 5-9 March 1990.

Bawden, Richard J. 2000. A cautionary tale of the Hawkesbury experience: a case study of reform in agricultural education. In *Integrating Concepts of Sustainability into Education for Agriculture and Rural Development*, edited by van den Bor, Wout, Peter Holen, Arjen Wals, and Walter Leal Filho. SOCRATES thematic network for Agriculture Forestry Aquaculture and Environment, AFANet. Frankfurt, New York: Peter Lang Scientific Publishers.

Borsari, B., M. F. Vidrine and S. Doherty. 2002. Assessing students' preparedness towards sustainability in U.S. and European undergraduate agricultural curricula. *Journal of Alternative Agriculture* 17(4): 188–194.

Borsari, B., and M. F. Vidrine. 2000. An evaluation tool for improving undergraduate curricula in agriculture. Sustainable Agriculture—Fertile Ground for Growth in the Agricultural Sciences. *Journal of College Science Teaching* 29(4): 235-240.

Francis, Charles A., Geir Lieblein, Juha Helenius, Lennart Salomonsson, Hanne Olsen, and John Porter. 2001. *Commentary: Challenges in designing ecological agriculture education: A Nordic perspective on change. American Journal of Alternative Agriculture* 16 (2).

Francis, Charles A., S. Gliessman, T. A. Breland, N. Creamer, R. Harwood, L. Salomonsson, J. Helenius, D. Rickerl, R. Salvador, M. Wiedenhoef, S. Simmons, P. Allen, M. Altieri, C. Flora, and R. Poincelot. 2003. Agroecology: the ecology of food systems. *Journal of Sustainable Agriculture* 22 (3).

Gliessman, S.R. 2000. *Field and Laboratory Exercises in Agroecology. Instructor's Appendices: Appendix A and B*. Washington, DC: Lewis Publishers.

Glasser, Harold. 2003. Learning our way to a sustainable and desirable world: some ideas inspired by Arne Naess and Deep Ecology. In *Higher Education and the Challenge of Sustainability: Contestation, Critique, Practice and Promise*, edited by Arjen E., J. Wals, and Peter Blaze Corcoran. Dordrecht, Netherlands: Kluwer Academic Publishers.

Orr, David W. 1994. *Earth in Mind: On Education, Environment and the Human Prospect*. Island Press.

van den Bor, Wout, Peter Holen, Arjen Wals, and Walter Leal Filho (eds.). 2000. *Integrating Concepts of Sustainability into Education for Agriculture and Rural Development*. SOCRATES thematic network for Agriculture Forestry Aquaculture and Environment, AFANet

Print Resources

Altieri, M.A., and C.A. Francis 1992. *Commentary: Incorporating agroecology into the conventional agricultural curriculum*. *American Journal of Alternative Agriculture* 7 (1, 2).

Provides rationale for agroecology courses, discusses methodology and perspectives, and suggests specific course components

Bawden, Richard J., Lawrence Busch, and Arsenio O. Gagni. 1991. The agricultural university for the 21st century. Article prepared for the World Conference on Education for all (WCEFA), Jomtien, Thailand, 5-9 March 1990. *Impact of Science on Society*. No. 164, 353–366.

Bawden presents a call for reform in agricultural education toward environmental, interdisciplinary, systems-based, experiential, and learner-based curricula in order for agriculture education to remain relevant to the students' changing social and environmental context.

Bawden, Richard J. 2000. A cautionary tale of the Hawkesbury experience: a case study of reform in agricultural education. In *Integrating Concepts of Sustainability into Education for Agriculture and Rural Development*, edited by van den Bor, Wout, Peter Holen, Arjen Wals, and Walter Leal Filho. SOCRATES thematic network for Agriculture Forestry Aquaculture and Environment, AFANet. Frankfurt, New York: Peter Lang Scientific Publishers. Available from: www.clues.abdn.ac.uk:8080/afanet/afa_susbk.html

Provides an overview of the reform in the agriculture curriculum at Hawkesbury Agricultural College, Australia from traditional discipline-based learning and teaching to an interdisciplinary, systems-based, experiential and learner-based pedagogy and curriculum.

Francis, Charles A., Geir Lieblein, Juha Helenius, Lennart Salomonsson, Hanne Olsen, and John Porter. 2001. *Commentary: Challenges in designing ecological agriculture education: A Nordic perspective on change*. *American Journal of Alternative Agriculture* 16 (2).

This article encourages reform in agriculture education by three specific means: 1) increasing emphasis on food and food production systems; 2) integrating research methods and learning objectives from the social sciences to encourage a greater understanding of the food system complexities; 3) action research involving experiential education and field research.

Francis, Charles A., S. Gliessman, T. A. Breland, N. Creamer, R. Harwood, L. Salomonsson, J. Helenius, D. Rickerl, R. Salvador, M. Wiedenhoeft, S. Simmons, P. Allen, M. Altieri, C. Flora, and R. Poincelot. 2003. Agroecology: the ecology of food systems. *Journal of Sustainable Agriculture* 22 (3). Available online: agroeco.org/brasil/material/agrodef81.htm

Authored by leading agroecologists, the article defines agroecology as necessarily an interdisciplinary science and provides an historical overview of the development of the discipline. The article profiles several innovative sustainable agriculture programs in the U.S. and abroad, and encourages an integrated approach to education on sustainability in agricultural systems.

Gliessman, S.R. 2000. *Field and Laboratory Exercises in Agroecology. Instructor's Appendices: Appendix A and B*. Washington, DC: Lewis Publishers.

Provides a thorough overview of short- and long-term preparations for teaching field and laboratory investigations in agroecology.

Glasser, Harold. 2003. Learning our way to a sustainable and desirable world: some ideas inspired by Arne Naess and Deep Ecology. In *Higher Education and the Challenge of Sustainability: Contestation, Critique, Practice and Promise*, edited by Arjen E., J. Wals, and Peter Blaze Corcoran. Dordrecht, Netherlands: Kluwer Academic Publishers.

Journal of Sustainable Agriculture. For information see: www.haworthpress.com/web/JSA/

“This timely journal examines our current agricultural industry and the threat to its resource base. The goal is to promote the study and application of sustainable agriculture for solutions to the problems of resource depletion and environmental misuse.” - Raymond P. Poincelot, PhD, Editor and Associate Dean, College of Arts & Sciences, Fairfield University, Fairfield, Connecticut

Orr, David W. 1994. *Earth in Mind: On Education, Environment and the Human Prospect*. Island Press.

Provides a critique of conventional higher education and encourages an interdisciplinary and values based approach to education.

Renewable Agriculture and Food Systems (journal). Available from: www.cabi-publishing.org

Renewable Agriculture and Food Systems (formerly the *American Journal of Alternative Agriculture*) is a “multi-disciplinary journal which focuses on the science that underpins economically, environmentally, and socially sustainable approaches to agriculture and food production. The journal publishes original research and review articles on the economic, ecological, and environmental impacts of agriculture; the effective use of renewable resources and biodiversity in agro-ecosystems; and the technological and sociological implications of sustainable food systems. Contains a discussion forum, which presents lively discussions on new and provocative topics.”

van den Bor, Wout, Peter Holen, Arjen Wals, and Walter Leal Filho (eds.). 2000. Integrating Concepts of Sustainability into Education for Agriculture and Rural Development. SOCRATES thematic network for Agriculture Forestry Aquaculture and Environment, AFANet, Frankfurt, New York: Peter Lang Scientific Publishers. Available from: www.clues.abdn.ac.uk:8080/afanet/afa_susbk.html

Part I provides a conceptual overview of challenges and strategies of integrating sustainability concepts into higher education. Part II provides 20 case studies of higher education programs that have successfully integrated sustainability principle and practices into the curriculum.

Curricula

Deutsch, Jonathan. 2003. *Teaching Food: Agriculture, Food and Society Syllabi and Course Materials Collection*. Association for the Study of Food and Society and the Agriculture and Human Values Society. Available online: www.food-culture.org/ASFS-AFHVS-Syllabi2003.pdf (note: 5.5 MB file)

A publication of the Association for the Study of Food and Society, and the Agriculture and Human Values Society providing an extensive listing of social science courses addressing issues in food and agriculture.

Miles, A., and M. Brown (eds.). 2005. *Teaching Direct Marketing and Small Farm Viability: Resources for Instructors*. Santa Cruz, CA: Center for Agroecology and Sustainable Food Systems, UC Santa Cruz. Available online: zzyx.ucsc.edu/casfs/training/manual/contents.html

Resources for teaching about farm and business planning, direct marketing with a focus on Community Supported Agriculture (CSA) management, land tenure options, and other small-farm viability issues. Features lecture outlines, class and field demonstration outlines, trainee exercises, and resource materials. The manual can be used in a classroom setting or adapted for other training formats, such as short courses, conferences, and field days.

Miles, A. and M. Brown (eds.). 2002. *Teaching Organic Farming and Gardening: Resources for Instructors*. Santa Cruz, CA: Center for Agroecology and Sustainable Food Systems, UC Santa Cruz. Available online: zzyx.ucsc.edu/casfs/training/manual/contents.html

This 600-page manual covers practical aspects of organic farming and gardening, applied soil science, and social and environmental issues in agriculture. Units contain lecture outlines for instructors and detailed lecture outlines for students, field and laboratory demonstrations, assessment questions, and annotated resource lists. The manual can be used in a classroom setting or adapted for other training formats, such as short courses, conferences, and field days.

Web Resources

Alternative Farming Systems Information Center

www.nal.usda.gov/afsic/ofp/

AFSIC specializes in locating and accessing information related to alternative cropping systems, including sustainable, organic, low-input, biodynamic, and regenerative agriculture. AFSIC also focuses on alternative crops, new uses for traditional crops, and crops grown for industrial production. The Center is supported in part by USDA's Sustainable Agriculture Research and Education program, and a cooperative agreement with the University of Maryland, College Park, MD.

Appropriate Technology Transfer to Rural Areas (ATTRA)

The National Sustainable Agriculture Information Service

www.attra.ncat.org/

An outstanding and comprehensive resource providing information on all aspects of sustainable agriculture including: Agronomy and soil science; pest management; organic farming; livestock production; marketing; k-12 educational resources; calendar of events; funding opportunities and much more.

Directory of Student Farms: The New Farm/ Rodale Institute

www.newfarm.org/features/0104/studentfarms/directory.shtml#

The New Farm's preliminary guide to farms on campus. The list is arranged regionally; each entry includes the name of the farm, year founded, acres in cultivation, primary markets, and web address if available. We've focused here on campus farms that provide substantial, hands-on, small-scale farming experience to undergraduate and graduate students; many also offer programs for children and the general public. For more information on courses and degree programs in sustainable farming, see the USDA's Educational and Training Opportunities in Sustainable Agriculture (below).

Journal of Natural Resources and Life Sciences Education

www.jnrlse.org/

The *Journal of Natural Resources and Life Sciences Education* is a comprehensive database for life science educational resources. The Journal is continuously updated online during the year and one hard copy is published in December of each year by the American Society of Agronomy. Contains links to following associations, each with instructional resource components: American Association for Agricultural Education; American Institute of Biological Sciences; American Phytopathological Society; American Society for Horticultural Science; American Society of Plant Biologists; Crop Science Society of America; Ecological Society of America; Entomological Society of America; Soil Science Society of America.

Sustainable Agriculture Links (Purdue University)

www.ces.purdue.edu/sa/saglinks.html

An outstanding list of links to national and international sustainable agriculture programs and resources.

Sustainable Agriculture Research and Education (SARE)

www.sare.org/

Since 1988, the Sustainable Agriculture Research and Education (SARE) program has helped advance farming systems that are profitable, environmentally sound and good for communities through a nationwide research and education grants program. The program, part of USDA's Cooperative State Research, Education, and Extension Service, funds projects and conducts outreach designed to improve agricultural systems.

University of California Sustainable Agriculture Research and Education Program (SAREP)

www.sarep.ucdavis.edu/

Provides a concise overview of the key themes in sustainable agriculture, especially as they relate to California. Presents information on natural resources, production practices, and the social and economic context of sustainability issues.

USDA Agricultural Research Service, National Agriculture Library - Educational and Training Opportunities in Sustainable Agriculture (15th Edition 2002)

www.nal.usda.gov/afsic/AFSIC_pubs/edtr.htm

A directory of college and university sustainable agriculture programs around the nation.

PowerPoint Resources

California Agriculture Teachers Association (CATA) Sustainable Agriculture PowerPoint resources: www.ccagcans.com (see “Course Curriculum”)

The CATA Sustainable Agriculture PowerPoint set contains over 40 titles developed by leading agricultural professionals addressing various aspects of sustainable food systems and organic agricultural production practices.

- Amphibians on the Farm, by Robert L. Bugg
- An Introduction to Sustainable Food Systems: The Origins, Evolution, and Future of the U.S. Agri-Food System, by Albie Miles.
- Basic Integrated Pest Management Concepts, by Lucia Varela and Cheryl Wilen
- Basic Plant Science, by Laura Mendes
- Beneficial Insects and Habitat, by Robert L. Bugg
- California Certified Organic Farmer's (CCOF) Certification, by Jake Lewin
- Composting, by Laura Mendes
- Cool Weather Crops, by Steve Quirt
- Cover Crops, by Laura Mendes
- Crop Planning and Record Keeping for Diversified Farms, based on work by Dan Kaplan of Brookfield Farm, Amherst, MA
- Energy Inputs in Food Production, adapted from Stephen Gliessman
- Extended Crop Rotations for Organic Systems, by Jim Riddle

- Farmscaping with Native Plants, by Sam Earnshaw
- Fostering Organic Livestock, by Jim Riddle
- Garden Calendar, by Laura Mendes
- Genetic Resources and Biological Diversity in Agriculture, by Mark Van Horn
- Grazing Behavior and Species Integration in Grazing Systems, by Jean-Marie Luginbuhl
- Grazing Management Principles, by Paul Mueller
- Hedgerows for California Agriculture, by Sam Earnshaw
- Inspecting Organic Farms, by Jim Riddle
- International Federation of Organic Agriculture Movements (IFOAM), by Louise W.M. Lutikholt
- Introduction to Agricultural Sustainability, by Laura Mendes
- Marketing Principles and Practices for Sustainable Agriculture, by Deborah Walton
- Manure Management, by Albert Strauss
- National Organic Program Information, by Jim Riddle
- National Organic Standards by Jim Riddle
- Organic Farming and Food Conference, by Kim Dietz
- Organic Outlook, by Jim Riddle
- Organic Poultry Certification, by Jim Riddle
- Organic Processing, by Jim Riddle
- Organic Requirements: A Presentation for Pest Control Advisors, by Brian McElroy
- Organic Viticulture Practices, by Ann Thrupp
- Pasture Ecology, by Paul Mueller
- Prather Ranch, by Prather Ranch
- Protecting Organic Standards, by Jim Riddle
- Recordkeeping Tips for Organic Certification, by Jim Riddle
- Soil Sustainability, by Mark Van Horn and Hunter Francis
- Specialty Crops, by Paul Vossen
- Sustainable and Industrial Agriculture Methodologies in the Consumer-Oriented World of Today: A Comparative Analysis of the Agricultural Methodologies of Sustainable and Industrial Farming in the New Millennium, by Timothy Maciag
- Sustainable Practices in Animal Production, by Michelle Macfarlane
- Understanding Plant Growth: Implications for Grazing/Harvesting Management, Natural Resource Conservation Service Natural Resource Conservation Service

University of California Sustainable Agriculture Research and Education Program (UC SAREP)

UC SAREP offers a number of educational resources on alternative and certified organic agriculture. Please see: www.sarep.ucdavis.edu/events/ for a complete listing of educational programs and resources, including the proceedings of the Organic Vegetable Production Short Course, which offers 12 online PowerPoint presentations covering many aspects of certified organic production and related research.

Other Resources**The College Farms Sustainable Agriculture Education Working Group (CFSAEWG)**

The College Farms Sustainable Agriculture Educators Working Group promotes post-secondary sustainable agriculture education through field-based experiential learning on California college farms. The working group is committed to continually improving the quality of educational programs through mutual support and collaboration on projects of common interest. The working group includes staff, faculty, administrators, and students from post-secondary institutions that have, or are interested in having, a college farm with a focus on sustainable agriculture. The CFSAEWG promotes the increased use of college farms by faculty, instructors, and students, and sustainable agriculture education, in general, at their institutions.

California Polytechnic State University

Sustainable Agriculture Resource Consortium (SARC)

c/o Horticulture and Crop Science Department

San Luis Obispo, California 93407

Hunter Francis, Program Coordinator

(805) 756-5086

www.calpoly.edu/~sarc

California State University, Chico

Lee Altier, Professor

College of Agriculture

www.csuchicoag.org

Center for Agroecology & Sustainable Food Systems (CASFS)

University of California, Santa Cruz

1156 High Street, Santa Cruz, CA 95064

Diane Nichols, Apprenticeship Program Coordinator

email: danichol@ucsc.edu

www.ucsc.edu/casfs

(831) 459-2321

College of the Redwoods

Eureka, Ca

Franz Rulfsen

(707) 845-6977

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www.redwoods.edu

New College of California, North Bay

Culture, Ecology and Sustainable Communities Program

Miriam Volat, Ecological Agriculture Concentration Coordinator/Instructor

99 5th Street,

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email: miriam@ropescourse.com
www.newcollege.edu
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