

AG 230 -- SUSTAINABLE AGRICULTURE

COURSE DESCRIPTION: Evaluation of conventional and alternative farming methods in the USA, Polynesia, Southeast Asia, Africa, and Latin America from a long-term perspective. Analysis of the effects of those practices on environmental quality, agroecosystems, and food security. Consideration of conflicting values and resolution.

COURSE OBJECTIVES:

1. To acquaint the student from agricultural as well as other disciplines with conventional and alternative agricultural production practices throughout the world and their effect on long-term sustainability and environmental quality.
2. To show how agricultural scientists are attempting to minimize agricultural pollution and sustain food production adequate for the world's population.

EXPECTED LEARNING OUTCOMES:

1. The student will be able to explain the major aspects of agricultural practices and traditions through time and throughout the world, including the USA, Polynesia, Southeast Asia, Africa, and Latin America.
2. The student will be able to explain in general the relationships among culture, economics, politics, science, and agricultural development. A solid understanding of the cross-cultural interactions and exchange that linked the world's people and facilitated agricultural development is also expected.
3. The student will have studied and analyzed refereed-journal articles, texts, and practices that represent the perspectives of different societies and agricultural traditions.

INSTRUCTOR: Dr. Bruce W. Mathews

TEXTS: Funes, F., L. García, M. Bourque, N. Pérez, and P. Rosset. 2002. Sustainable agriculture and resistance: Transforming food production. Food First Books, Oakland, CA.

Eusebio, J.A., and R.V. Labios. 2001. Food security: Integrated farming systems with environmentally friendly approaches. JMC Press Inc., Quezon City, Philippines.

UNEP. 1995. Ecofarming: The Chinese experience. United Nations Environment Programme. Nairobi, Kenya.

- REFERENCES:** Altieri, M.A. 2001. Genetic engineering in agriculture: The myths, environmental risks, and alternatives. Food First Spec. Rep. 1, Food First/Institute for Food and Development Policy, Oakland, CA.
- Beets, W.C. 1990. Raising and sustaining productivity of smallholder farming systems in the tropics: A handbook of sustainable agricultural development. AgBbe Pub., Alkmaar, Holland.
- Buresh, R.J., P.A. Sanchez, and F. Calhoun. (ed.) 1997. Replenishing soil fertility in Africa. SSSA Spec. Publ. No. 51. SSSA and ASA, Madison, WI.
- Clarke, W.C., and R.R. Thaman. 1993. Agroforestry in the Pacific Islands: Systems for sustainability. United Nations Univ. Press, Tokyo, Japan.
- Conway, G. 1998. The doubly green revolution: Food for all in the Twenty-First Century. Comstock Publishing, Cornell Univ. Press. Ithaca, NY.
- Edwards, C.A. et al. (ed.) 1990. Sustainable agricultural systems. Soil and Water Conservation Society. Akeny, IA.
- Gliessman, S.R. 2001. Agroecosystem sustainability: Developing practical strategies. CRC Press, Boca Raton, FL.
- Glover, N., and L. Ferentinos. 1994. Pacific Islands farm manual. ADAP Project, Univ. of Hawaii at Manoa, Honolulu, HI.
- Handy, E.S.C., and E.G. Handy. 1972. Native planters in Old Hawaii: Their life, lore, and environment. Bernice P. Bishop Museum Bull. 233.
- Hollyer, J.R., J.L. Sullivan, and M.E. Josephson. 1997. Taro: mauka to makai. A taro production and business guide for Hawai'i growers. CTAHR, Univ. of Hawaii at Manoa, Honolulu, HI.
- International Institute of Rural Reconstruction (IIRR). 1992. Agroforestry technology information kit. Silang, Cavite, Philippines.
- IIRR. 1993. The bio-intensive approach to small-scale household food production. Silang, Cavite, Philippines.
- MacRae, R.J., S.B. Hill, G.R. Mehuys, and J. Henning. 1990. Farm-scale agronomic and economic conversion from conventional to sustainable agriculture. *Adv. Agron.* 43:155-198.

Mollison, B. 1990. Permaculture: A practical guide for a sustainable future. Island Press, Washington, DC.

Powers, L.E., and R. McSorley. 2000. Ecological principles of agriculture. Delmar. Albany, NY.

Rigby, D., and D. Cáceres. 2001. Organic farming and the sustainability of agricultural systems. *Agricultural Systems* 68:21-40.

Scheewe, W. Nurturing the soil - feeding the people. Rex Publishing, Philippines

GRADING:	Exam 1	100 pts
	Exam 2	100 pts
	Final (60% new material)	140 pts
	Problem sets/questions	60 pts
	Term Paper	100 pts
	<u>Lab assign./participation</u>	<u>100 pts</u>
	Total possible	600 pts

540 or more ($\geq 90\%$)	= A
480-539 (80 - 89%)	= B
420-479 (70 - 79%)	= C
360-419 (60 - 69%)	= D
359 or less ($\leq 59\%$)	= F

Note: Assignments turned in one class period late will be docked 20%. Assignments turned in one week late (or thereafter) will be docked 40%.

SUSTAINABLE AGRICULTURE - LECTURE OUTLINE

1. Alternative Farming Movements in the Tropics

2. Tropical Agriculture and Food Security
3. Transforming the Rural Tropics: Property, Markets, Cooperatives, and Technological Change
4. Social Organization and Sustainability of Small Farm Agriculture in the Tropics
5. Agroecological Education and Training
6. Ecological Pest Management
7. Intercropping
8. Mechanization
9. Advances in Integrated and Organic Soil Management
10. Waste Recycling
11. Integration of Crops and Livestock
12. Urban Agriculture
13. Agronomic Crop Production in the Tropics
14. Medicinal Crops
15. Ecological Agriculture in Southeast Asia and China (UNEP Bulletin)
16. Ecological Considerations for the Future of Food Security in Africa (Brown article)
17. Sustainable Agriculture in Latin and South America (Gliessman and Villachica articles)
18. Systems for Sustainability in Polynesia (Clarke and Thaman articles)

SUSTAINABLE AGRICULTURE LABORATORY

1. Projects comparing conventional and alternative crop production practices will be conducted by the students at the University Farm. These will include experiments on soil preparation; use of composts, mulches, and manures; plant spacing and combinations; agroforestry; and germplasm evaluation. In addition, there will be a number of activities at the sustainable agriculture demonstration site.
2. Field trips to various production operations and research facilities.

Note: Shoes are required for all lab activities!