

Appalachian State University, Department of Interdisciplinary Studies
IDS 5251 Agroecology Practices, Systems and Philosophies (4).

Class: Wednesday 6-9 pm, 223 LLA

Lab: Tuesday (Section 201) and Friday (Section 202), 14:00-16:30pm, SD Teaching and Research Farm and/or Agroecology Lab in Valle Crucis

Instructor: Christof den Biggelaar, Ph.D.

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Office hours: TR 10:45-12, W 10-12, and by appointment.

General outline

People around the world have developed (and continue to develop) different systems of producing and processing food and fiber necessary to sustain them. This course will explore (1) the ethical and philosophical roots of conventional and alternative agriculture, and (2) the biological, economic and social aspects of different agricultural systems and practices developed in response to perceived shortcomings of conventional modern agriculture. Alternative practices and systems to be compared and contrasted in this course include nature farming, permaculture, biodynamic agriculture, biointensive gardening, and agroforestry (additional systems and practices may be added or substituted based on class interest and consensus).

There is a lab requirement for this course; students registering for this course also need to enroll in either IDS 5251-201 (Tuesday 2-4:30) or IDS 5251-202 (Friday 2-4:30).

Prerequisite

Open to students who have completed the Principles of Agroecology (IDS 3251) or equivalent course in population, community or ecosystem ecology, or permission of the instructor.

Course objectives

The objective of this course is to introduce students to a variety of different sustainable agricultural systems and practices, and their philosophical and theoretical underpinnings. Students successfully completing the course should be able to:

1. Demonstrate an in-depth understanding of the philosophical bases of various agricultural systems, and how such different philosophical driving forces are brought to bear in what farmers do and how they farm.
2. Be able to identify and describe relevant changes in ethical behaviors necessary to make both agriculture and the society in which it is embedded more sustainable.
3. Demonstrate an in-depth understanding of the linkages between healthy soil, healthy crops, healthy individuals, healthy communities and healthy societies.
4. Be able to apply scientific agroecological principles and methods on which regenerative agricultural practices are based as demonstrated by the development of a comprehensive management plan (incl. Goals and objectives; resource inventory; action plan; and monitoring/record keeping plan) for a local organic farm.
5. Be able to work cooperatively with others on a professional level and participate effectively in class discussions and assignments.

Course format

The course will use a discussion/seminar format, as well as lectures by the instructor and/or guest lecturers. As part of the lab component of this course, we will make some field trips to local farms

practicing different systems/methods discussed in the course. Students will be assigned to present selected topics either individually (book review assignment) or in a group (design project). Attendance and active participation in all class activities is essential and required.

Important considerations

1. Students are expected to be aware of and follow the ASU's current "Code of Academic Integrity."
2. Incomplete grades are generally not given, and are granted solely at the instructor's discretion.
3. Papers are due at the scheduled beginning of class, and attendance is taken at that time. Tardiness will result in reduced credit; more than 5 absences will result in a failing grade for the course.
4. Students are expected to read assigned texts and other materials BEFORE class and be prepared to discuss the material.

Assignments

Paper I: Now that the meaning of 'organic' has officially been determined in rules and regulations, food producers are using additional terms to sell their products. In advertisements for supermarkets and food warehouses, fast food restaurants, etc., the words 'fresh' and 'natural' seem ubiquitous to make consumers buy their food. But what do these terms really mean? Write a 500 (min) to 700 word (max.) essay on your understanding of the meaning of one of these terms in/for today's food system. This essay is due Thursday January 25.

Paper II: Write a 3-4 page (single spaced) essay on your personal philosophy (believes) of/for a sustainable food system, that is, a system of agriculture and food that is environmentally sound, economically viable and socially just (and/or any other term or concept relevant to the description of sustainability in your opinion). In the statement, include (1) how you arrived at this philosophy (= its foundations, who or what shaped your thinking), and (2) your thoughts and ideas of how you think this system might be realized locally, and what your contributions might be. Hint: write this paper from the heart, not the head (i.e., this is not a research paper, but you can quote and cite people who have influenced your thinking about sustainable agriculture and food systems). The paper should be a minimum of 5 pages. This paper is due Feb 8.

Paper III: This is a research paper in which you propose one of the agricultural systems discussed in this course as an alternative, sustainable solution to the present conventional agriculture/food system in NW North Carolina. This requires a sophisticated understanding of both the present agricultural system as well as of the alternative system you propose and will defend in this paper. The paper will be graded based on your understanding of the two agricultures (its practices, systems, methods and philosophical driving forces); the suitability, feasibility and viability of the alternative system you propose; the strength of your arguments in defending your alternative, and your ability to link theory with the reality of farming practice; and extensiveness of your research and effort. The paper should be at least 10 pages (incl. references as appropriate), and is due on the last regular class day.

Presentation I: On April 21, you will take to role of lecturer, and do an in-depth presentation on the contributions to sustainability of agricultural biotechnology. As both proponents and opponents of biotechnology argue that it can advance sustainability, with others in the latter camp also arguing that it may undermine the sustainability agenda, you should cover both sides of the argument in your presentation.

Presentation II: Prepare and make a 20 minute presentation based on your research paper (Paper III). The presentation will be in the scientific conference format, with questions and discussion at the end.

Group project: As a team of graduate students, you will write a comprehensive farm plan to turn the SD

Teaching and Research farm into a more student-run operation. The plan should follow the Whole Farm Planning format, and include:

- The development of goals, objectives and long-term vision;
- An inventory and assessment of physical, biological, human and economic/financial resources;
- The identification and evaluation of management alternatives, and the development of an action plan;
- The development of a monitoring and evaluation plan to assess progress toward the established goals.

Alan Savory's Holistic Resource Management is the bible on comprehensive farm planning.

However, there are a lot of spin-offs based on this book available on the web to help farmers plan for the future. You can search for them under the keywords "Whole Farm Planning" Mollison's Permaculture Design Manual also has some useful information, particularly re. resource inventories.

At various times (to be announced), there will be short presentations to the class to report on the progress of your project.

Grading

Lecture *150 points*

Class attendance and participation	15%
Group project	35%
Paper I	10%
Paper II	10%
Paper III	15%
Presentation I	5%
Presentation II	10%

Lab *100 points*

Participation	40%
Lab reports/article reviews	20%
Lab journal	30%
Maintenance of farm records	10%

Semester total *250 points*

Requirements for written papers

1. Written papers are graded on scholarly quality, mastery of the material, conciseness, organization, use of readings, grammar and spelling. Style will be a consideration in grading.
2. Papers must be word-processed; title pages, plastic covers etc. are not required. Diagrams, drawings, and tables may be used as appropriate; these can be done by hand if you have not (yet) mastered computer graphics.
3. The journal will be graded based on the amount of effort you have put into assembling it (i.e., number of articles gathered, organization, neatness, and diversity of sources of the contributions).
4. Any assignments turned in late will receive a lower grade. All assignments must be turned in to receive a passing grade for the course.

Texts

Required

Paul B. Thompson. 1995. *The spirit of soil. Agriculture and environmental ethics.* New York: Routledge.

Herbert H. Koepf, Bo D. Pettersson, Wolfgang Schaumann. 1976. Chapters 1, 2, 4, 5, and 10. In *Bio-dynamic Agriculture: An Introduction.* Spring Valley, NY: The Anthroposophic Press. Out of

print, but available on the web at: <http://www.soilandhealth.org/01aglibrary/010114koepf/bda.html>

Masanobu Fukuoka. 1985. One straw revolution. Mapusa, Goa, India: Other India Press..

Optional/recommended

Maria Thun. 1999. Gardening for Life, The Biodynamic Way. Stroud, Gloucestershire, UK: Hawthorn Press.

John Jeavons. 1995. How to grow more vegetables. Berkeley, CA: Ten Speed Press.

Bill Mollison. 1991. Introduction to Permaculture. Tyalgum, Australia: Tagari Publications.

Additional readings (library reserve * /on-line; books available on reserve readings #)

On reserve in the library

Bill Mollison. 1988. Permaculture Designer's Manual. Tyalgum, Australia: Tagari Publications. S605.5 .M64 1988

Louise Buck et al. 1999. Agroforestry in Sustainable Agricultural Systems. Boca Raton FL: CRC Press. S494.5.A45 A375123 1999

Patrick Whitefield. 1996. How to make a forest garden. East Meon, Hampshire, UK: Permanent Publications. SB439.6 .W591 1998

Patrick Whitefield. 2000. Permaculture in a nutshell. Hampshire, UK: Permanent Publications and White River Junction, VT: Chelsea Green Publishing. S494.5.P47 W51 2000

Robert Hart. 1996. Forest Gardening. Cultivating an Edible Landscape. White River Junction, VT: Chelsea Green Publishing Co. S494.5.A45 H37 1996

Agroecology philosophy and theory

For Feb 8 class:

* Miguel Altieri. 2002. Agroecology: The science of natural resource management for poor farmers in marginal environments. Agriculture, Ecosystems and Environment 93: 1-24.

* George Kuepper. 2000. An overview of organic crop production.
<http://attra.ncat.org/attra-pub/PDF/organiccrop.pdf>

For Feb 15 class:

* Jan Douwe van der Ploeg. 1994. "Styles of Farming: An introductory note on concepts and methodology." In Jan Douwe van der Ploeg and Ann Long, eds., Born from within: Practices and perspectives of endogenous rural development, pp. 7-30. Assen, Netherlands: van Gorcum.

For April 19 class:

* Daniel Charles. 2002. 'Epilogue: The Story.' In: Lords of the Harvest, pp. 303-314. Cambridge, MA: Perseus Publishing.

General organic crop production information:

<http://www.agroecology.org>

Resource guide to organic & sustainable vegetable production (Contains sections with references on nature farming, biodynamics, biointensive etc.)

Nature farming

<http://www.moa.or.jp/english/philosophy/philo-contents.html>

<http://www.moa.or.jp/english/naturefarm/nf-contents.html>

<http://www.spiritwheel.com/thnfarm.htm>

<http://www.johreifellowship.com/philosophy.html>

<http://www.shumei.org/agriculture/principles.html>

[Fukuoka Farming method](#)

Biodynamics

Willy Schilthuis. 1994. *Biodynamic Agriculture. Rudolf Steiner's Ideas in Practice*. Hudson, NY: Anthroposophic Press.

Hugh Lovel. 2000. *A Biodynamic Farm*. Austin, TX: Acres USA.

<http://www.biodynamics.com/biodynamics.html>

<http://www.biodynamics.com/steiner.html>

<http://www.biodynamics.com/articles/>

<http://www.attra.org/attra-pub/biodynamicap1.html>

<http://www.elib.com/Steiner/Lectures/Dates>

[Biodynamic calendar](#)

Biointensive

John Jeavons. 1995. "A perspective for the future", "Biointensive made simple", "A general preface", "An historical introduction", "History and philosophy", and "Sustainability." In: *How to grow more vegetables*, pp. viii-xxiv, 2-5 and 21-29. Berkeley, CA: Ten Speed Press.

<http://www.growbiointensive.org/biointensive/InContext.html>

Permaculture

Bill Mollison. 1988. Chapters 1 and 2. In *Permaculture: A Designers' Manual*, pp. 1-105. Tyalgum, Australia: Tagari Publications.

Patrick Whitefield. 2000. *Permaculture in a nutshell*. Hampshire, Eng.: Permanent Publications.

<http://attra.ncat.org/attra-pub/perma.html>

<http://www.nor.com.au/environment/perma/>

<http://www.permaculture.co.uk/>

Agroforestry

* R.K. Olson, M. Schoeneberger and S. Aschmann. 2000. "An ecological foundation for temperate agroforestry." In G.E. Garrett, W.J. Rietveld and R.F. Dick, eds., *North American Agroforestry: An integrated science and practice*, pp. 31-62. Madison: American Society for Agronomy, Inc.

* M.A. Gold, W.J. Rietveld, H.E. Garrett and R. F Fisher. 2000. "Agroforestry nomenclature, concepts, and practices for the USA." In G.E. Garrett, W.J. Rietveld and R.F. Dick, eds., *North American Agroforestry: An integrated science and practice*, pp. 63-78. Madison: American Society for Agronomy, Inc.

Patrick Whitefield. 1996. Chapters 1 and 2. In: *How to make a forest garden*, pp. 1-44. East Meon, Hampshire, UK: Permanent Publications.

Robert Hart. 1996. Forest Gardening. Cultivating an Edible Landscape. White River Junction, VT: Chelsea Green Publishing Co.

Association for Temperate Agroforestry
U Missouri-Columbia Center for Agroforestry

Course schedule

<u>Date</u>	<u>Topic</u>	<u>Readings</u>
<u>Jan 11</u>	<u>Course introduction and overview</u> <u>Video: Strong Roots, Fragile Farms</u>	
<u>Jan 18</u>	<u>Ethics of soil</u> <u>Environmental critics of agriculture</u>	<u>Thompson, Chapters 1 & 2</u> <i>Paper I due.</i>
<u>Jan 25</u>	<u>The “who, what and why” of the Boone Community Garden</u> <u>Video: Alive and well (VC11181)</u>	
<u>Feb 1</u>	<u>The productionist paradigm</u> <u>Stewardship and good farming</u>	<u>Thompson, Chapters 3 & 4</u> <i>Potluck: Bring a dish to share</i>
<u>Feb 8</u>	<u>The true costs of food</u> <u>A quick and dirty overview of alternative farming practices.</u> <u>Discuss group project and divide into groups.</u>	<u>Thompson, Chapter 5</u> <u>Altieri (library reserve)</u> <u>Kuepper (ATTRA website)</u> <i>Paper II due</i>
<u>Feb 15</u>	<u>Holistic alternatives</u> <u>Styles of farming</u>	<u>Thompson, Chapter 6</u> <u>v.d. Ploeg,(library reserve)</u>
<u>Feb 22</u>	<u>Group presentation: Natural Agriculture philosophy & practice</u> <u>Nature farming: Video The Close to nature garden (VC 11243)</u>	<u>Fukuoka, One Straw Revolution</u> <u>Read as much as you like (it’s hard to put down once you start reading this), but at least read Chapters 1-5.</u>
<u>March 1</u>	<u>Group presentation: Permaculture philosophy & practice</u> <u>Video: Global Gardener</u>	<u>Mollison (Intro to permaculture): Chapters 1 + 3</u> <i>Potluck: Bring a dish to share</i>

<u>Mar 8</u>	<u>Group presentation: Biodynamic agriculture philosophy & practice</u> <u>Video: Biodynamic Gardening: A how-to guide</u> <u>The other side of the fence</u>	<u>Koepf, Chapters 1 + 2 (sections 1, 2, 3, 4 until p.70, 7) + 4</u>
<u>Mar 15</u>	<u>Spring break</u>	
<u>Mar 22</u>	<u>The design process: Concepts, themes and methods</u>	<u>Mollison (Intro to Permaculture)</u> <u>Chapter 2</u> <u>Also consult Mollison's Designer's Manual (lib. reserve) Chapters 2 + 3</u>
<u>Mar 25</u>	<u>Organic Growers School & Seed Exchange (extra credit)</u>	
<u>Mar 29</u>	<u>Group presentation: Agroforestry & Forest Gardening</u> <u>Video: Temperate Agroforestry practices</u>	<u>Olson et al., Gold et al., Whitefield, Chapters 1 + 2.</u> <u>Potluck: Bring a dish to share</u>
<u>April 5</u>	<u>Group presentations: Biointensive gardening</u> <u>Video: Garden Song & Circle of Plenty</u> <u>Each group will report on the progress made on their garden design project, the approach taken etc.; graduate students to report on the farm management plan</u>	<u>Jeavons, pp. viii-xxiv, 2-5 and 21-29.</u>
<u>April 12</u>	<u>Sustainable agriculture</u> <u>Video The Greening of Cuba (VC 11483)</u> <u>Open discussion about alternative agricultural systems.</u>	<u>Thompson, Chapter 7</u>
<u>April 19</u>	<u>Biotechnology in agriculture: A solution for world hunger and agricultural sustainability, or a disaster waiting to happen?</u> <u>Video: Harvest of Fear Part I.</u>	<u>Daniel Charles, Epilogue: The Story</u>
<u>April 26</u>	<u>Presentation and discussion of grad students term papers;</u> <u>Course evaluation.</u>	<u>Final paper due.</u>

<u>May 3</u>	<u>FINAL EXAM, 6-8:30pm</u> <u>Course wrap-up; if the weather is good, we will do a potluck picnic by campfire on the farm.</u>	<u>Groups will present their garden design/management plans at this time.</u> <i><u>Reports & designs are due</u></i> <i><u>Potluck: Bring a dish to share</u></i>
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Description

This hands-on laboratory course has two main activities:

1. This lab will involve a lot of preparatory work for the main growing season during the summer (which will focus on additional planting, maintenance and harvesting). Activities include soil preparation and feeding the soil, composting, seedling preparation, direct seeding and transplanting, weeding, some harvesting (of early crops such as lettuces, radishes, and mustard greens), and farm record keeping.
2. To learn about, and gather basic biophysical, ecological data of Dutch Creek farm, and the social characteristics of farming in Watauga County, and use this information to plan and operate a garden based on sustainable principles. As needed and working in small groups, students will collect and analyze data on the vegetation, soils, hydrology, fauna (insects, birds, mammals both in and above the soil), climate, and the socioeconomic and cultural aspects of farming in the area. Each student will keep a detailed record of activities and observations.

Attendance and active participation in all lab activities is essential and required!

Course format

Each laboratory session will consist of instructional time to discuss techniques and tasks followed by application of techniques. Tasks may be independent or carried out in small groups. Students in this lab will be expected to make regular, short presentations on the theoretical aspects of agroecology based on their reading relevant articles/book chapters to be provided by the instructor.

Graduate students will help out as ‘crew’ chiefs for teams of undergraduates in the lab to guide and help them accomplish their tasks.

Objectives

At the end of the semester, students should be able to:

1. Demonstrate a more sophisticated (theoretical) knowledge of the biophysical, ecological and socio-economic and cultural principles of crop and/or animal production necessary for farm planning, management and operation.
2. Demonstrate a mastering of practical knowledge of gardening techniques and methods, including soil and seedling preparation; direct seeding; crop rotation; companion planting; fertilization; pest, disease and weed control; composting; harvesting and post-harvest handling, etc. The specific practices and techniques to be mastered will depend on the crops to be grown and their requirements and needs.
3. Apply the information listed under 1 and 2 above to determine which crops to grow where, when, and how, and be able to explain why.
4. Be able to work cooperatively with others and participate effectively in lab discussions and work assignments, and provide leadership to work teams on the farm.

Important considerations

1. Students are expected to be aware of and follow the ASU’s current “Code of Academic Integrity.”
2. Incomplete grades are generally not given, and are granted solely at the instructor’s discretion.
3. Papers are due at the scheduled beginning of class, and attendance is taken at that time. Tardiness will result in reduced credit; more than 5 absences will result in a failing grade for the course.
4. Students are expected to read assigned texts and other materials BEFORE class and be prepared to

- discuss the material.
5. The lab will consist almost entirely of hands-on field work, and will take place rain or shine. Wear sturdy work boots, bring gloves, wear long-sleeved shirts (to minimize poison ivy contact and insect bites), be prepared for inclement weather (wear layers), etc.
 6. Given the time to travel to and from Valle Crucis, students are expected to be punctual. A van will leave a 2 PM sharp to take students to the field site; we usually leave at 4:30 from the site, to be back at ASU at 5 pm.

Texts

Laboratory course packet available from SOS Printing; this packet includes information of various exercises related to soils; vegetation surveys; insect and disease scouting and controls; and crop requirements (rotations, companion planting, nutrient needs, ...).

Jeff Ball et al., 1995, Rodale's Garden Problem Solver: Vegetables, Fruits and Herbs. Emmaus, PA: Rodale Press.

Barbara Pleasant et al., 1996, The Gardener's Weed Book: Earth-Safe Controls. Pownal, VT: Storey Publishing.

Additional hand-outs and relevant articles, tbd.

Assignments

1. Students are required to keep a lab journal in which they write their own observations and interpretations of what they have seen, done and learned.
2. Selected lab topics/sections (e.g., soils, vegetation, nutrient cycling) will have their own data collection sheets, information on data analysis and questions to answer in the lab manual. *These will need to be completed and turned in at the beginning of the following week's lab.* Only one report need to be turned in for the group you worked with that week (but list the name of all group members).
3. Students are required to register all observations, equipment breakdowns, notes about the various vegetables (yields by date and variety; diseases, pests, etc.; amounts eaten and/or donated to Hospitality House/Hunger Coalition) in a farm notebook that will be provided and left on the farm.
4. Periodically, instructors will provide relevant articles; each student should read and turn in a one page (max) summary of the article the following lab period.
5. Participate in one (or more) events relevant to the course and lab, such as the High Country Organic Growers School in late March, monthly Farmer Field Schools, or events organized by the ASU Solar Club or other organizations that are relevant to food and agriculture.