SENIOR SEMINAR IN SUSTAINABLE AGRICULTURE

BI 402B, Spring 2010
Fridays 1:00-1:50 Lovejoy 301
Office hours: Th: 2:00-4:00 and by appointment
Course webpage: http://www.colby.edu/biology/BI402B/LabPg.htm

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Description: This seminar will explore some of the important questions and themes underlying the sustainability of our agricultural infrastructure. We will begin by reading and discussing a portion of a book that will serve as a primer of sorts for those unfamiliar with agricultural technology as well as the practical aspects of farming. The authors of this book propose innovative, if somewhat controversial, solutions to mend rifts that have developed within the agricultural community between those who see the role of farming as primarily a source of abundant inexpensive food and those who desire to minimize the negative environmental and social impacts of food production. Most of the semester will be spent informally debating some of the important issues that currently divide the agricultural community by drawing upon evidence from the scientific literature. On March 5 we will attend a talk that is part of the Biology Department's Spring Colloquium series.

Objectives: Participants in the seminar will gain an understanding of the science behind sustainable farming, and an appreciation for the social and economic forces that slow the transition from problematic conventional practices to more sustainable ones. We will explore controversies about what constitutes ecologically acceptable farming practice, and we will have opportunities to develop and clarify our thoughts through dialog with one another about these controversies. Participants will gain experience delving into the primary scientific literature to extract evidence that will be used to bolster or refute debate resolutions concerning these issues. It is my hope that the seminar brings you an awareness of yourselves as "consumers, voters, and policy decision makers who want to make food choices and policy that will support ecologically responsible farming."[1]

Sustainable Agriculture Seminar Reading List: I have assembled a list of dozens of pivotal articles from the scientific literature that will serve as sources of factual information as we reflect upon and attempt to resolve a number of contentious agricultural sustainability issues. The articles are available in PDF format on the course webpage. As other pertinent articles crop up during the semester, they will be added to the list.

Format: Except for the first couple of weeks, which we will use to get an overview of the major issues, class meetings will combine informal debate with seminar-style discussion. Each week a pair of students will open our meeting by presenting debate arguments representing countervailing views of an issue. The presenters will bolster their arguments by drawing upon evidence from readings they have assigned to the class. The remainder of our meeting will then be devoted to clarifying the most prominent points in the assigned readings and reflecting together on the questions and ideas that they raise. Presentation order will be determined by lottery during our first meeting. Positions "For" and "Against" a given resolution will be determined by coin toss.

Attendance: You are expected to attend all class meetings prepared to participate in class discussion. "Participation" means *active* engagement in class discussion, which may include particularly attentive listening, as well as asking other students questions and responding to their comments. "Preparation" means reading the assigned articles and bringing written questions and notes to class. For each class meeting, you should set aside about three hours for preparation. Unexcused absences or coming late to a number of classes will make you eligible to FAIL the course.

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[1] Ronald P & Adamchak R 2008 *Tomorrow's Table: Organic Farming, Genetics, and the Future of Food.* Oxford Univ. Pr. 208pp

Debate Resolutions: The list of sustainable agriculture topics in the following outline will serve as the basis for forming debate resolutions. We will generate a list of debate resolutions during our first couple of meetings. If you have ideas for other debate topics, please send them to me.

1) Energy Use
2) Biodiversity
- a) Loss of Habitat
- b) Environmental Pollution
- c) Pesticide Impacts on Non-target wildlife
- d) Genomic Impacts
  - *i) Loss of Genetic Diversity of Cultivars*
  - *ii) Trans-genetic Contamination of Wild Species*

3) Soil Management Strategies
- a) Erosion Prevention
- b) Sources of Nutrients

4) Agricultural Bioethics
- a) Ownership of Agricultural Genetic Diversity
- b) Livestock Management

5) Human Health and Nutrition

Here are a couple of examples of what I mean by debate resolutions:

1) Resolved, There is no difference using synthetic fertilizers compared to organic fertilizers for providing plant nutrition because nutrients must be mineralized before being used by plants.

2) Resolved, Large-scale adoption of organic farming is not feasible because there is not a large enough quantity of compostable materials available to meet the nutritional needs of the crops.

Some Suggestions for Reading Scientific Articles:

1) First, determine the type of article you're dealing with. Articles generally fall into one of three categories: a) full-blown **research report** with Intro, Methods, Results, etc., b) **review article** (also meta-analysis), which amalgamates research works of others, and c) **commentary** or opinion piece written by an expert on the topic.

2) As quickly as you can, figure out what the author's **thesis** is. The abstract (summary) should provide this, but it may also be helpful to peruse any figures and tables contained in the article in order to understand how the research question has been approached.

3) Map the **argument** or **evidence** the author employs to answer the research question and support the thesis. How are the different parts connected?

4) Now that you have a good sense of the organization of the article, **read slowly** and look up the significant terms you do not know. At this point, don't worry if you are unfamiliar with intricate details of methods or analysis techniques.

5) **Reread** at least once to make sure you did not overlook something on the initial pass.

6) **After** you have given the author a thorough and **sympathetic interpretation**, examine the article from a **critical** point of view. Were the methods employed robust and appropriate to answering the research question and supporting the thesis? Was the interpretation presented in a clear, logical fashion? Does the author rely on questionable assumptions? How convincingly does the evidence support the conclusions?

Office Hours: I will have office hours on Thursdays from 2:00-4:00. Office hours can be busy. I would be happy to make an appointment for a longer period of time. You can speak to me after class, call, or email me. Most days I am in my office and you should feel free to stop by to talk about the class, your readings, or your debate presentation.

Acknowledgement: My friend and colleague, William Edelglass, inspired some of the ideas for this syllabus. Portions were lifted with modifications from his Environmental Philosophy syllabus.