

AFS 501: Current Research in Organic and Sustainable Agriculture

Fall Semester 2014
Friday, 9:10 am – 12 pm
23 Hulbert Hall

Instructors

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Course Description

The primary purpose of the course is to introduce students to the diversity of current research (in terms of academic disciplines, theoretical orientations, and research methods) in the area of organic and sustainable agriculture. The course uses an interdisciplinary array of issues, speakers, and articles to fuel in-depth discussion of the goals, procedures, and future direction of research in organic and sustainable agriculture.

Student Learning Outcomes

At the end of the course students should be able to:

- (1) Define and explain the history of “organic agriculture” and “sustainable agriculture.”
- (2) Describe the three ‘legs’ (environmental, economic, and social) of the sustainability ‘stool’.
- (3) Evaluate how current research advances the sustainability of agricultural practices/systems.
- (4) Identify the theoretical and practical challenges to achieving sustainable agriculture.
- (5) Appreciate the diversity of ways in which agricultural scientists (including social scientists) conduct research in the area of organic and sustainable agriculture.

Required Readings and Useful Resources

PDFs or links to all required readings will be available on the Angel course website (see details below). The course website will also include PDFs and links for useful resources. Students are encouraged, but not required, to look at the useful resources.

Assignments and Evaluation

Students will be evaluated on the basis of class attendance and participation, submitted questions on assigned readings, an expert interview assignment, literature review, and final presentation.

Class Attendance	5%
Class Participation	20%
Questions on Assigned Readings	10%
Expert Interview Assignment	25%
Literature Review	25%
Final Presentation	15%
TOTAL	100%

Final grades will be computed according to the following:

A = 94–100%	B = 83–86%	C = 73–76%	D = 60–66%
A- = 90–93%	B- = 80–82%	C- = 70–72%	F = 0–59%
B+ = 87–89%	C+ = 77–79%	D+ = 67–69%	

Class Attendance – Students are expected to attend all classes and field trips.

Class Participation – The success of this course depends on the active participation by everyone. Students should be prepared to ask thoughtful questions to the guest panelists, engage in discussions about the assigned readings, and participate in Q&A after student presentations.

Questions on Assigned Readings – At the beginning of each class period, students will hand in a minimum of four questions related to the assigned readings. Questions should relate to the theories, concepts, research methods, and/or subject matter discussed in the reading(s). Questions should be developed individually rather than with other class members. Evaluation of questions will be based on depth of engagement with the assigned readings. Questions will be graded using the following scale: 0 = unsatisfactory or no questions submitted, 1 = satisfactory (met expectations), and 2 = outstanding (went beyond expectations). Questions will be used, in part, to guide in-class discussions of the assigned readings.

Expert Interview Assignment – Each student will (a) interview an “expert” (faculty member, USDA/ARS scientist, extension specialist, practitioner, etc.) in the area of organic or sustainable agriculture, (b) summarize and reflect upon the interview findings in a written report (4–6 pages not including list of questions, double spaced, 12 point font, 1 inch margins), and (c) discuss the interview findings in class. More details about the expert interview assignment will be provided in class. Important dates: Students must turn in names of potential interviewees by Friday, September 5 (or earlier) and record the date and time of your interview (even if it has already taken place) into the Angel course space by Friday, September 12. **Expert Interview Assignments are due in class on Friday, October 3.**

Literature Review – Each student will write a literature review (8–12 pages not including references, double spaced, 12 point font, 1 inch margins) about a particular line of research related to organic or sustainable agriculture. Students should *not* write literature reviews related directly to their own thesis/dissertation projects. More details about the literature review assignment will be provided in class. Important dates: Students should have their topics approved by the instructors by Friday, October 10 (or earlier). **Literature reviews are due by 5 pm on Monday, November 10.**

Class Presentation – Each student will give a presentation (15–20 minutes) based on his/her literature review. The use of PowerPoint is required. Evaluation of the presentations will be based on logic and information quality, subject knowledge, organization of presentation, effective design and graphics, and speaking quality (including peer review). **The class presentations will take place on December 5 and December 12.**

Angel

Important materials for this course will be available on the course website in Angel (<https://lms.wsu.edu/>). On the Angel homepage, enter your WSU username and password. You will then see a list of your courses on the left. Click on “Res Organic & Sustainable Ag (2014-fall PULLM AFS 501-01).” Here you will find the course syllabus, assignment instructions, calendar, required readings, handouts, useful resources, course announcements, and more. The instructors will periodically add new materials and links to the Angel course website. It is your responsibility to familiarize yourself with Angel and check the Angel course website regularly for important announcements and information.

Late Penalties

Writing assignments handed in after the due dates specified will receive a 10% penalty per day.

Assessment of Student Learning Outcomes (Course Objectives)

Student Learning Outcomes (Course Objectives)	Assessment Methods*
<i>At the end of the course, students should be able to ...</i>	
(1) Define and explain the history of “organic agriculture” and “sustainable agriculture.”	DP, QoR
(2) Describe the three ‘legs’ (environmental, economic, and social) of the sustainability ‘stool’.	DP, EI, QoR
(3) Evaluate how current research advances the sustainability of agricultural practices/systems.	EI, LR
(4) Identify the theoretical and practical challenges to achieving sustainable agriculture.	DP, EI, LR, QoR
(5) Appreciate the diversity of ways in which agricultural scientists (including social scientists) conduct research in the area of organic and sustainable agriculture.	DP, EI, QoR

* DP = Discussion Participation; EI = Expert Interview; LR = Literature Review; QoR = Questions on Readings

Disability Statement

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center (Washington Building 217) to schedule an appointment with an Access Advisor. All accommodations MUST be approved through the Access Center.

Academic Integrity Statement

As an institution of higher education, Washington State University is committed to principles of truth and academic honesty. All members of the University community share the responsibility for maintaining and supporting these principles. When a student enrolls in Washington State University, the student assumes an obligation to pursue academic endeavors in a manner consistent with the standards of academic integrity adopted by the University. To maintain the academic integrity of the community, the University cannot tolerate acts of academic dishonesty

including any forms of cheating, plagiarism, or fabrication. Washington State University reserves the right and the power to discipline or to exclude students who engage in academic dishonesty. Students found responsible for academic integrity violations may receive an F on the particular assignment or exam, as well as an F for the course. Repeated and/or serious offenses may result in referral to the conduct board and expulsion from WSU. For graduate students, academic integrity violations may also result in the loss of teaching and/or research assistantships.

Academic Integrity Statement and link to WSU's policy:

<http://www.wsulibs.wsu.edu/plagiarism/main.html>

<http://conduct.wsu.edu/academic-integrity-policies-and-resources/>

Safety Statement

The Campus Safety Plan, which can be found at <http://safetyplan.wsu.edu>, contains a comprehensive listing of University policies, procedures, statistics, and information relating to campus safety, emergency management, and the health and welfare of the campus community. All faculty, staff, and students are encouraged to visit this web site as well as the University emergency management web site at <http://oem.wsu.edu/Emergencies.html> to become familiar with the campus safety and emergency information provided.

COURSE TOPICS IN BRIEF

8/29/14	Introduction
9/5/14	Unpacking “Organic Agriculture”
9/12/14	Unpacking “Sustainable Agriculture”
9/19/14	Climate Friendly Farming
9/26/14	Field Trip to Cook Farm
10/3/14	Potluck / Discussion of Expert Interviews
10/10/14	Waste Management Field Trip
10/17/14	Case of Biodegradable Plastic Mulch
10/24/14	Sustainable Meat
10/31/14	Agroecosystem Design
11/7/14	Sustainability of Fruit Production Systems
11/14/14	Sustainability of Local Food Systems
11/21/14	Crop Breeding for Organic/Sustainable Agricultural Systems
11/28/14	Thanksgiving Break
12/5/14	Class Presentations
12/12/14	Class Presentations

DETAILED COURSE SCHEDULE

8/29/14	<p>Introduction</p> <p>[No required readings]</p>
9/5/14	<p>Unpacking “Organic Agriculture”</p> <p><i>Guest Lecturer:</i></p> <p>David Granatstein (Soil Science / CSANR)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Kristiansen, P. 2006. Overview of organic agriculture. In <i>Organic Agriculture: A Global Perspective</i>, ed. P. Kristiansen, A. Taji, and J. Reganold, 1-23. CSIRO Publishing. http://www.publish.csiro.au/samples/OrganicAgSample.pdf 2. Granatstein, D., and A. Schwartz. 2007. The emergence of organic agriculture in Washington State. Whatcom Watch. http://www.whatcomwatch.org/php/WW_open.php?id=858 3. Howard, P.H. 2014. Information Graphics: Organic. https://www.msu.edu/~howardp/organicindustry.html
9/12/14	<p>Unpacking “Sustainable Agriculture”</p> <p><i>Panel Discussion of the Three ‘Legs’ of Sustainability:</i></p> <p>David Bezdicek (Soil Science) Lynne Carpenter-Boggs (Soil Science) Kate Painter (Economics) Jessica Goldberger (Sociology)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Ikerd, J.E. 2008. Do we really need to define sustainable agriculture? In <i>Crisis and Opportunity: Sustainability in American Agriculture</i>, 95-102. Lincoln, NE: University of Nebraska Press. 2. Earles, R. 2005. Sustainable agriculture: An introduction. National Sustainable Agriculture Information Service (ATTRA). https://attra.ncat.org/attra-pub/viewhtml.php?id=294 3. National Research Council. 2010. Summary and Chapter 1 (Understanding Agricultural Sustainability) of <i>Toward Sustainable Agricultural Systems in the 21st Century</i>. Washington, DC: National Academies Press. http://www.nap.edu/catalog.php?record_id=12832

<p>9/19/14</p>	<p>Climate Friendly Farming</p> <p><i>Panel Discussion of Climate Friendly Farming:</i></p> <p>Chad Kruger (CSANR) Mike Brady (Economics) Von Walden (Geophysics) Stewart Higgins (Plant Ecology)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> Schahczenski, J., and H. Hill. 2009. Agriculture, climate change and carbon sequestration. National Sustainable Agriculture Information Service (ATTRA). https://attra.ncat.org/attra-pub/summaries/summary.php?pub=297 Eigenbrode, S.D., S.M. Capalbo, L.L. Houston, J. Johnson-Maynard, C. Kruger, and B. Olen. 2013. Agriculture: Impacts, adaptation, and mitigation. In <i>Climate Change in the Northwest: Implications for Our Landscape, Waters, and Communities</i>, ed. M.M. Dalton, P.W. Mote, and A.K. Snover, 149-180. http://occri.net/wp-content/uploads/2013/11/ClimateChangeInTheNorthwest.pdf
<p>9/26/14</p>	<p>Field Trip to Cook Farm</p> <p><i>Field Trip Speakers:</i></p> <p>Dave Huggins (Soil Science) Erin Brooks (Hydrology) Sarah Waldo (Atmospheric Science)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> Huggins, D.R., C.E. Kruger, K.M. Painter, and D.P. Uberuaga. 2014. Site-specific trade-offs of harvesting cereal residues as biofuel feedstocks in dryland annual cropping systems of the Pacific Northwest, USA. <i>Bioenergy Research</i> 7: 598-608. Brooks, E.S., J. Boll, and P.A. McDaniel. 2012. Hydopedology in seasonally dry landscapes: The Palouse region of the Pacific Northwest USA. In <i>Hydopedology: Synergistic Integration of Soil Science and Hydrology</i>, ed. H. Lin, 329-350. Academic Press, Elsevier B.V.
<p>10/3/14</p>	<p>Potluck / Discussion of Expert Interviews</p> <p><i>Invited Guest:</i></p> <p>Joan Davenport (Soil Science)</p> <p>[No required readings]</p>

10/10/14	<p>Waste Management Field Trip</p> <p><i>Field Trip Speakers:</i></p> <p>Lynne Carpenter-Boggs (Soil Science) Craig Frear (Biological Systems Engineering) Shulin Chen (Biological Systems Engineering)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Van de Klundert, A., and J. Anschutz. 1999. Integrated sustainable waste management: The selection of appropriate technologies and the design of sustainable systems is not (only) a technical issue. Paper prepared for the CEDARE/IETC Inter-Regional Workshop on Technologies for Sustainable Waste Management, 13-15 July 1999. http://www.worldbank.org/urban/solid_wm/erm/Annexes/US_Sizes/Annex_4B.3.pdf
10/17/14	<p>Case of Biodegradable Plastic Mulch</p> <p><i>Panel Discussion of USDA-SCRI Transdisciplinary Project:</i></p> <p>Debbie Inglis (Plant Pathology) Carol Miles (Horticulture) Tom Marsh (Economics) Jessica Goldberger (Sociology) Jeremy Cowan (Extension)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Corbin, A.T., C.A. Miles, J. Cowan, D.G. Hayes, J. Moore-Kucera, and D.A. Inglis. 2014. Current and future prospects for biodegradable plastic mulch in certified organic production systems. http://www.extension.org/pages/67951/current-and-future-prospects-for-biodegradable-plastic-mulch-in-certified-organic-production-systems 2. Goldberger, J.R., R.E. Jones, C.A. Miles, R.W. Wallace, and D.A. Inglis. 2013. Barriers and bridges to the adoption of biodegradable plastic mulches for U.S. specialty crop production. <i>Renewable Agriculture and Food Systems</i>. Published Online August 9, 2013. 3. Li, C., J. Moore-Kucera, J. Lee, A. Corbin, M. Brodhagen, C. Miles, and D. Inglis. 2014. Effects of biodegradable mulch on soil quality. <i>Applied Soil Ecology</i> 79: 59-69.

<p>10/24/14</p>	<p>Sustainable Meat</p> <p><u>Guest Lecturer:</u> Jan Busboom (Animal Science / Extension)</p> <p><u>Required Readings:</u></p> <ol style="list-style-type: none"> 1. Fairlie, S. 2011. Chapter 1 (Introduction), Chapter 3 (An Acre a Meal?), and Chapter 4 (Default Livestock) of <i>Meat: A Benign Extravagance</i>. White River Junction, VT: Chelsea Green Publishing Company. 2. Painter, K., E. Myhre, A. Bary, C. Cogger, and W. Jemmett. Breakeven analysis of small scale organic broiler production by breed.
<p>10/31/14</p>	<p>Agroecosystem Design</p> <p><u>Panel Discussion of Agroecosystem Design:</u> William Snyder (Entomology) David Crowder (Entomology) Ian Burke (Weed Science)</p> <p><u>Required Readings:</u></p> <ol style="list-style-type: none"> 1. Kleijn, D. et al. 2006. Mixed biodiversity benefits of agri-environmental schemes in five European countries. <i>Ecology Letters</i> 9: 243-254. 2. Crowder, D.W., T.D. Northfield, M.R. Strand, and W.E. Snyder. 2010. Organic agriculture promotes evenness and natural pest control. <i>Nature</i> 466: 109-112. 3. Lu, Y., K. Wu, Y. Jiang, Y. Guo, and N. Desneux. 2012. Widespread adoption of Bt cotton and insecticide decrease promotes biocontrol services. <i>Nature</i> 487: 362-365. 4. Schonbeck, M. 2007. Integrated pest management concepts for weeds in organic farming systems. eOrganic article. March 23. 5. Gallandt, E.R., M. Liebman, and D.R. Huggins. 1999. Improving soil quality: Implications for weed management. <i>Journal of Crop Production</i> 2(1): 95-121.
<p>11/7/14</p>	<p>Sustainability of Fruit Production Systems</p> <p><u>Discussion of Fruit Production Systems:</u> John Reganold (Soil Science) Preston Andrews (Horticulture)</p> <p><u>Required Readings:</u></p> <ol style="list-style-type: none"> 1. Reganold, J.P., J.D. Glover, P.K. Andrews, and H.R. Hinman. 2001. Sustainability of three apple production systems. <i>Nature</i> 410: 926-930. 2. Reganold, J.P., P.K. Andrews, J.R. Reeve, L. Carpenter-Boggs, C.W. Schadt, J.R. Alldredge, C.F. Ross, N.M. Davies, and J. Zhou. 2010. Fruit and soil quality of organic and conventional strawberry agroecosystems. <i>PLoS One</i> 5(9): e12346.

11/14/14	<p>Sustainability of Local Food Systems</p> <p><i>Panel Discussion of Food Systems Research:</i></p> <p>Marcy Ostrom (Environmental Studies / Sociology) Jeremy Sage (Economics) Emily Kennedy (Sociology)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> Martinez, S. et al. 2010. <i>Local food systems: Concepts, impacts, and issues</i>. Economic Research Report 97. Economic Research Service, U.S. Department of Agriculture. (Concentrate on “What is Local Food?” and “Benefits of Local Food Markets.” Skim the rest of the report.) Sage, J.L., V.A. McCracken, and R.A. Sage. 2013. Bridging the gap: Do farmers’ markets help alleviate impacts of food deserts? <i>American Journal of Agricultural Economics</i> 95(5): 1273-1279. DeLind, L.B. 2011. Are local food and the local food movement taking us where we want to go? Or are we hitching our wagons to the wrong stars? <i>Agriculture and Human Values</i> 28(2): 273-283.
11/21/14	<p>Crop Breeding for Organic/Sustainable Agricultural Systems</p> <p><i>Panel Discussion of Crop Breeding:</i></p> <p>Kevin Murphy (Crop Science) Rebecca McGee (Crop Science)</p> <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> Ceccarelli, S. 2014. GM crops, organic agriculture, and breeding for sustainability. <i>Sustainability</i> 6: 4273-4286. Lammerts van Bueren, E.T., S.S. Jones, L. Tamm, K.M. Murphy, J.R. Myers, C. Leifert, and M.M. Messmer. 2011. The need to breed crop varieties suitable for organic farming, using wheat, tomato and broccoli as examples: A review. <i>NJAS – Wageningen Journal of Life Sciences</i> 58: 193-205.
11/28/14	<p>Thanksgiving Break</p> <p>[No required readings]</p>
12/5/14	<p>Class Presentations</p> <p>[No required readings]</p>
12/12/14	<p>Class Presentations</p> <p>[No required readings]</p>