

Weed Management for Organic and Sustainable Cropping Systems
HOS 4932, Section 0781; HOS 6932, Section 2311

Time: Monday, Wednesday, Friday; 2nd period (8:30 to 9:20 am)
Location: 2316 Fifield Hall

Spring 2018

Instructor	Carlene A. Chase	Phone	(352) 273-4770
Office	Horticultural Sciences Department 1245 Fifield Hall	E-mail	cachase@ufl.edu
Office Hours	Thursdays 10 AM -12 PM Fridays 1 PM - 3 PM		

Course Description: Ecological principles can be applied in agroecosystems to manage weeds in a more sustainable manner. Alternative weed management approaches that are less dependent on herbicides and utilize ecological processes detrimental to weed and weed seed survival will be emphasized. Students will learn actively by critically analyzing pertinent literature and participating in discussions of supplemental reading.

Course Objectives: Students will learn how ecological approaches can be utilized to manage weeds in a sustainable manner. In addition, students will develop or improve skills for critically analyzing scientific literature and hone their oral presentation skills by serving as a moderator and by participating in discussions of weed science with peers. Students will polish their research and writing skills by preparing a grant proposal.

Required Textbooks: None

Recommended Texts

Chauhan, B.S. and G. Mahajan. 2014. Recent Advances in Weed Management. Springer, New York Heidelberg Dordrecht London.

Hatcher, P.E. and R.J. Froud-Williams. 2017. Weed Research: Expanding Horizons. John Wiley & Sons, Hoboken, NJ.

Liebman, M., C.L. Mohler, and C.P. Staver. 2001. Ecological Management of Agricultural Weeds. Cambridge University Press, Cambridge.

Upadhyaya, M.K. and R.E. Blackshaw. 2007. Non-chemical Weed Management: Principles, Concepts and Technology. CABI, Wallingford.

Supplemental Materials

Booth, B.D., S.D. Murphy, and C.J. Swanton. 2010. Invasive plant ecology in natural and agricultural systems. Second edition. CABI Publishing.

Bowman, G. 2001. Steel in the field: a farmer's guide to weed management tools. Sustainable Agriculture Network, Beltsville.

Håkansson, S. 2003. Weeds and weed management on arable land: an ecological approach. CABI Publishing.

Radosevich, S.R., J.S. Holt, and C.M. Ghersa. 2007. Ecology of Weeds and Invasive Plants: Relationship to Agriculture and Natural Resource Management, 3rd Edition. John Wiley & Sons, New York.

Ross, M.A. and C.A. Lembi. 2008. Applied Weed Science: Including the Ecology and Management of Invasive Plants. Prentice Hall, Upper Saddle River.

Course Schedule

Date			Topics/Learning Experiences
January	Mon.	8	Introduction and Orientation
	Wed.	10	Weeds – Ecological Definition, Adverse Effects and Utility
	Fri.	12	Ecological Weed Management
	Mon.	15	<i>NO CLASS - M.L.K. Holiday</i>
	Wed.	17	Weed Life History
	Fri.	19	Preventive Measures
	Mon.	22	The National Organic Rule - Permitted Practices
	Wed.	24	Herbicides permitted in organic cropping systems
	Fri.	26	Weed-Crop Interactions, Competition
	Mon.	29	Competition Lab (<i>Students will set up 2 studies in the greenhouse</i>)
	Wed.	31	What Plants Talk About – https://www.youtube.com/watch?v=CrrSAc-vjG4
February	Fri.	2	Allelopathy
	Mon.	5	Biofumigation
	Wed.	7	Cultural Weed Management
	Fri.	9	Examination 1
	Mon.	12	Cultural Weed Management
	Wed.	14	Quiz. Cultural Weed Management (<i>Student-Moderated Discussion</i>)

	Fri.	16	Cultural Weed Management
	Mon.	19	Physical Weed Control – Mulches
	Wed.	21	Quiz. Physical Weed Control – Soil Solarization (<i>Student-Moderated Discussion</i>)
	Fri.	23	Physical Weed Control – Thermal methods
	Mon.	26	Physical Weed Control – Grits (Titles for Grant Proposals Due)
	Wed.	28	Anaerobic Soil Disinfestation
March	Fri.	2	Mechanical Weed Control – Tillage
	Mon.	5	NO CLASS – Spring Break
	Wed.	7	NO CLASS – Spring Break
	Fri.	9	NO CLASS – Spring Break
	Mon.	12	Mechanical Weed Control – Cultivation
	Wed.	14	Quiz. Automated Weed Control (<i>Student-Moderated Discussion</i>)
	Fri.	16	Examination 2
	Mon.	19	Introduction to Biological Control of Weeds
	Wed.	21	Quiz. Weed Seed Predation (<i>Student-Moderated Discussion</i>)
	Fri.	23	Biological Control Using Microorganisms/Bioherbicides
	Mon.	26	Lab – <i>Final data collection from Competition Lab</i>
	Wed.	28	Livestock for Weed Management
	Fri.	30	Quiz. Livestock for Weed Management (<i>Student-Moderated Discussion</i>)
April	Mon.	2	Chemical Weed Control – Soil fumigants (Proposal Drafts and Lab Introduction are due)
	Wed.	4	Chemical Weed Control – Synthetic Herbicides
	Fri.	6	Chemical Weed Control – Synthetic Herbicides
	Mon.	9	Herbicide resistance
	Wed.	11	Quiz. Sustainability of Herbicide-Resistant Crops (<i>Student-Moderated Discussion</i>)
	Fri.	13	Unmanned aerial vehicle use for weed management
	Mon.	16	Integrated Weed Management vs Ecological Weed Management
	Wed.	18	Student Grant Proposal Presentations (Grant Proposals and Lab Reports Due)
	Fri.	20	Student Grant Proposal Presentations
	Mon.	23	Review for Exam
	Wed.	25	Examination 3

Examinations and Grades

Assignment	Undergraduate		Graduate	
	Total Points	Percent of Grade	Total Points	Percent of Grade
Examinations	600	60	600	60
Discussion moderator	–	–	100	10
Quizzes	200	20	100	10
Grant Proposal/Presentation	–	–	200	20
Lab report	200	20	–	–
TOTAL	1000	100	1000	100

Grading Policy

Score	Percent	Grade
900 to 1000	90 to 100	A
850 to 899	85 to 89.9	B+
800 to 849	80 to 84.9	B
750 to 799	75 to 79.9	C+
700 to 749	70 to 74.9	C
650 to 699	65 to 69.9	D+
600 to 649	60 to 64.9	D
0 to 599	0 to 59.9	E

Course Format: Student-centered learning involving lectures, student oral presentations, and student-moderated discussions of primary literature read in advance of class.

Policies: Attendance and participation in moderating and discussions are required. Students are urged to arrive on time to avoid disrupting class. Late assignments and make-up exams are permitted only for excused absences. Acceptable documents for an excused absence include a doctor's note or a funeral program. Mobile phones must be turned off during class. Discourse during discussions must be polite and respectful.

Student Deliverables

Examinations: Three examinations, essay type and short answer responses.

Discussion Moderator: Select a current journal article (published within the past 5 years) on the assigned topic and share the selected article with the class at least 1 week in advance of the scheduled discussion. Prepare a 15-minute presentation to provide background information on the topic using the article, other related journal articles, text books etc. Prepare 4 to 6 questions to stimulate the discussion.

Quizzes: Students will complete quizzes based on journal articles assigned for discussion.

Laboratory Report: Students will conduct 2 experiments and prepare a laboratory report based on one of the experiments. The report will include: title, objective, procedure, results and discussion, and references (Minimum of 5).

Grant Proposal: Students will develop a grant proposal on a sustainable and/or organic weed management problem formatted for submission to the Southern SARE Graduate Student grant program. Headings and associated word count to be used are as follows:

Project Abstract

Abstract is limited to no more than 250 words.

Statement of Problem, Rational and Justification

Statement of the problem being addressed, rationale and justification for objectives and the impact of the anticipated project. Begin the statement of the problem as: "*The purpose of this project is to*"... Limited to 500 words.

Project Relevance to Sustainable Agriculture

State how the project and the expected results contribute to agricultural sustainability. Don't simply tell us that your project addresses an element of sustainable agriculture, tell us HOW your project will address it and make it more sustainable. Make sure that your work -- even though it is making a part of a system more sustainable -- does not make the whole system or another part of it, less sustainable. Does your project use genetically engineered varieties or organisms? If so, state how their use will contribute to your project and make agriculture more sustainable. No more than 500 words.

Objectives

A numbered list of concise project objectives limited to no more than 500 words.

Approach and Methods

A brief description of the methods to be used for each objective, numbered according to their corresponding objective. **There must be a direct relationship between the approach and**

methods and the project relevance to sustainable agriculture. Approach and Methods is limited to no more than 1000 words.

Timetable

Timetable is limited to no more than 500 words.

Literature Cited

A minimum of 8 refereed journal articles is required.

Presentation: Students will make a 10 minute PowerPoint presentation of their grant proposals.

Academic Honesty: Students are expected to adhere to the University of Florida Honor Code: *We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.* Please refer to conduct regulations at <http://www.dso.ufl.edu/STG>. Violations of Academic Honesty Guidelines and the Honor code, which include cheating, plagiarism, bribery, misrepresentation, conspiracy, and fabrication, will not be tolerated.

Software Use: All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Counseling and Wellness Center: Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling and Wellness Center provides confidential counseling services at no cost for currently enrolled students. 3190 Radio Road, 392-1575, www.counseling.ufl.edu/cwc.

Students Requiring Accommodations: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. 001 Reid Hall, 392-8565, www.dso.ufl.edu/drc/.

Course Evaluation: Constructive feedback from students via course evaluation is requested to contribute to enhancing course quality. Students are requested to complete online evaluations at <https://evaluations.ufl.edu> when advised that the evaluation system is open.