

PLS 111: Agronomic Crop Production

Instructors. Instructor of record: Steven Haring, sharing@ucdavis.edu, office hours Tuesdays 1:00-2:00 pm Robbins 272 or Zoom; TA: Ignacio Macedo, imacedo@ucdavis.edu, office hours Mondays 11:00 am-noon on Zoom; TA: Matthew Fatino, mfatino@ucdavis.edu, office hours Wednesdays 9:30-10:30 am Robbins 140 (Office hours Zoom: <https://ucdavis.zoom.us/j/94496335876>)

Format. This is a 4-credit course that meets twice weekly. The lecture meets on Tuesdays from 4:10-5:00 pm in Asmundson 242, and the lab meets on Thursdays from 1:10 to 5:00 pm. The lecture period will utilize discussion and dialogue, including small group work and limited slideshow-based lecturing. The lab period will involve hands-on activities including observing field crops on campus and field trips around Yolo County. There will be several assignments that require synthesis of lab observations, information from lecture periods, and online resources for crop growers.

Importance. Agronomic crops serve as the foundation for many of the world's food systems. These (mostly) annual, large-scale, socio-ecological systems are typically managed as monocultures with chemical and mechanical inputs and marketed to produce food, animal feed, biofuel, or fiber products. This class is designed to familiarize you with basic information about agronomic cropping systems and help you integrate knowledge from personal observations, scientific literature, and professional sources.

Agronomic crops have enormous effects on the environment and on societies, and understanding agronomic cropping systems can help us understand how to maintain the productivity and increase the usefulness of these systems in the face of ongoing problems such as climate change and social inequity.

Objectives. Gain exposure to the world's major agronomic cropping systems. Get hands-on experience making observations of and creating management plans for crops. Understand how logistical, phenological, ecological, economic, and social factors influence crop growers. Use professional resources and decision support tools to make complex decisions about cropping systems. Evaluate uncertainties in crop science with critical analysis and scientific thinking. Identify challenges and opportunities that will affect agronomic crop growers in the future.

Acknowledgement. Agriculture in the US was built on stolen land with the hands of enslaved people. As an 1862 land-grant university, UC Davis was created directly with the profits from land

that was stolen from indigenous peoples. As agriculturalists strive to feed the world, we have left a complicated legacy of harm. This class could never completely address the social tradeoffs associated with large-scale crop production, but it is important to recognize that the tradeoffs exist and do affect food systems today. UC Davis' official land acknowledgement statement is as follows: *We should take a moment to acknowledge the land on which we are gathered. For thousands of years, this land has been the home of Patwin people. Today, there are three federally recognized Patwin tribes: Cachil DeHe Band of Wintun Indians of the Colusa Indian Community, Kletsel Dehe Wintun Nation, and Yocha Dehe Wintun Nation. The Patwin people have remained committed to the stewardship of this land over many centuries. It has been cherished and protected, as elders have instructed the young through generations. We are honored and grateful to be here today on their traditional lands.*

Conduct. Your class participation is necessary to facilitate a supportive learning community between you and your peers. Curiosity, critical thinking, and courtesy are important aspects of sharing in this community. Respect your peers by giving constructive criticism to one another, making space for their opinions, and voicing your perspective with statements that begin with “I think” or a similar phrase. Respect yourself by contributing your own unique viewpoint, speaking up with questions (all of which are important and appropriate), and taking responsibility for your intellectual health. This is a shared learning space, and we must work together to create a mutually-beneficial, comfortable learning environment. You must follow campus guidelines related to covid, which at the time of writing require vaccination, regular on-campus testing, and mask wearing at all times during class.

Attendance. It is essential that you show up to and participate in each class meeting. While in-person attendance is required, I trust you to self-enforce the attendance policy and determine when you need to take an excused absence. Class attendance is important, so please take care when deciding whether your current situation is more important than attending class. You *must* take an excused absence if you are sick or think you may be sick. Excused absences could also be related to caring for a sick family member, attending to non-covid illnesses or family matters, or dealing with other kinds of urgent or emergency situations.

Please email me when you have to miss class, so that we can discuss missed content. If you are unable to physically attend a lecture period, I will be happy to have you connect to class synchronously via Zoom if you email me by 3:55 pm on the day of the lecture. Unfortunately, UC Davis has not yet invested in the resources necessary to enable virtual field labs, so physical attendance is the only option for lab periods. We will be in close quarters travelling in vans for field

trips, so you owe it to your classmates to be vigilant about covid, maintain regular testing (as required by or more often than UC Davis policies), and stay home if you are sick.

Tentative Course Outline. Each week will have its own module on Canvas, which will contain required readings, materials for lab and lecture periods, and a fact sheet for the crop of the week. I will let you know as soon as possible if there are changes to the following outline.

Week 1. No lecture scheduled.

Lab meeting (09/23) not held in first week of class.

Week 2. Lecture (09/28), cropping systems principles, crop of the week: soybeans.

Lab (09/30), crop planting in the field at Veg Crops.

Week 3. Lecture (10/05), planting, tillage, soil prep, crop residues, crop of the week: dry beans.

Lab (10/07): Rice harvest field trip.

Week 4. Lecture (10/12), crop rotation and crop selection, crop of the week: corn.

Lab (10/14), stand counts, crop seedlings at Veg Crops.

Week 5. Lecture (10/19), seeds, seed varieties, GMOs, crop of the week: small grains.

Lab (10/21), Capay Mills and Center for Land Based Learning field trip.

Week 6. Lecture (10/26), water management, crop of the week: cotton.

Lab (10/28), crop nutrient analysis with Mark Lundy, Grow West fertilizer plant field trip.

Week 7. Lecture (11/02), Nutrient management lecture from Cameron Pittelkow, crop of the week: rice.

Lab (11/04), visit from Crop Protection Scientists from Corteva Agriscience.

Week 8. Lecture (11/09), pest management, crop of the week: alfalfa.

No lab meeting (11/11), Veteran's Day holiday.

Week 9. Lecture (11/16), harvesting and postharvest handling, crop of the week: cover crops.

Lab (11/18), Park Farming Organics field trip.

Week 10. Lecture (11/23), student-selected topic, crop of the week: perennial biofuel feedstocks.

No lab meeting (11/25), Thanksgiving holiday.

Week 11. Lecture (11/30), student-selected topics, crop of the week: students choose.

Lab (12/02), pest management, applying pesticides, spraying.

Grading. This course will utilize specification grading, in which each assignment will have minimum specifications required for passing. Each assignment is pass/fail, and you will pass if your work has each of the components required by the minimum specifications. Six passing assignments will earn a 'D', seven will earn a 'C', eight will earn a 'B', and nine or ten will earn an 'A'.

Deadlines, as described in the specs for each assignment, will be absolute. However, you will have the opportunity to resubmit up to two failing assignments with no penalty, within a week of when grades are released or as soon as possible with instructor approval if extenuating circumstances exist. It is not in my interest to fail anyone on any assignment, and this system is designed to create clear expectations with minimal stress and maximum opportunity for qualitative feedback.

Assignments. Each assignment will have its own assignment page on Canvas, which will have background information, complete instructions, and required specifications for passing.

1. Heat illness training* and introductory forum post (*heat illness training is required before participation in the lab)
2. Fertilizer application plan
3. Planting rate and depth observations abstract
4. Crop stage and development observations sheets
5. Mid-term assessment (not a quiz or exam)
6. Pest control recommendation
7. Integrated pest management plan
8. Reading summaries
9. Final assessment (not a quiz or exam)
10. Final exam – four short answer questions (take home exam submitted through Canvas, no meeting during final exam period)