Agronomy, Ph.D.

The mission of the Department of Agronomy is to generate, integrate and apply knowledge about crop plants that are grown for food, feed, and the general benefit of humankind. We find and disseminate answers to problems and discover opportunities concerning efficiency and sustainability of production, improvements in quality, and methods for safe and environmentally-sound practices.

An education in agronomy prepares graduates for professional careers in research, teaching, and extension at academic and government institutions, and for research and technical careers in industry in areas such as biotechnology, agroecology, cropping systems ecology and ecosystem modeling, crop management and protection, plant breeding, biochemistry, genetics, and genomics.

The UW–Madison Department of Agronomy is one of the most highly ranked and regarded departments in the nation. We are committed to integrated research, development, teaching, and outreach to address issues of food scarcity, food quality and nutrition, environmental impact, and sustainability.

The department maintains or has access to excellent facilities for research, including fully equipped laboratories, growth chambers and greenhouses, and complete field facilities at nearby agricultural research stations and throughout the state. Students have access to highly controlled plant growth facilities at the university’s Biotron and to special analytical services provided by the campus Biotechnology Center.

The Wisconsin Crop Innovation Center opened in 2017 and houses a cutting edge transgenic plant laboratory and 26,000 square feet of highly controlled greenhouse space and other lab facilities.

Admissions

Candidates for graduate study should have a bachelor’s degree in agriculture or in the biological, chemical, or physical sciences. Contact the department or visit the website (http://agronomy.wisc.edu/graduate-admissions/for-prospective-graduate-students) for details. Students considering graduate study in agronomy should make inquiries to the department several months before the desired enrollment date. In addition to the online application, the department requires a statement of purpose, GRE scores, transcripts, and three letters of recommendation.

Candidates for department research and teaching assistantships can be accepted twice a year, at summer/fall and spring admissions; however, candidates for university fellowships must apply by January 2 for fall enrollment.

Department deadlines are October 1 for spring admission and February 1 for summer/fall admission.

Agronomy admissions FAQs. (https://agronomy.wisc.edu/graduate-admissions/for-prospective-graduate-students)

The following courses are entrance requirements to pursue a Ph.D. in the Department of Agronomy. Applicants are required to have taken the following coursework:

- 1 year general chemistry with labs
- 1 semester organic chemistry with labs
- 1 semester physics
- 1 semester calculus
- 1 semester statistics
- 4 semesters of biology distributed among three of the following four areas: biochemistry; genetics; plant morphology, anatomy or physiology; and taxonomy, evolution, or ecology.

Graduate School Admissions

Graduate admissions is a two-step process between academic degree programs and the Graduate School. Applicants must meet requirements of both the program(s) and the Graduate School. Once you have researched the graduate program(s) you are interested in, apply online (https://grad.wisc.edu/admissions).

Funding

GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (https://grad.wisc.edu/funding) is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

Program Resources

The vast majority of our graduate students are awarded research assistantships to fund their education. These RA appointments come with tuition remission and a monthly stipend for living expenses. These assistantships come directly from the mentoring faculty; as a result, space in our graduate program is extremely limited. To find additional funding, click on the link to the Graduate School’s funding page below.

Graduate School: Student Funding (https://grad.wisc.edu/studentfunding/prospective)

The following are the Graduate School’s minimum stipend levels, for 50 percent appointments, beginning July 1, 2017 for annual appointments and August 21, 2017 for academic appointments:

- Research assistantship
  - Annual: $22,081
  - Academic: $18,067

- Teaching assistantship
  - Standard / academic: $16,196
  - Senior / academic: $18,067

- Project assistantship
  - Annual: $19,795
  - Academic: $16,196

- PA grader/reader
  - Hourly rate: $17.36

Requirements

Minimum Graduate School Requirements

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/
MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
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<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</table>

Mode of Instruction Definitions

**Evening/Weekend**: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

**Online**: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.

**Hybrid**: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

**Accelerated**: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

CURRICULAR REQUIREMENTS

<table>
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<tr>
<th>Minimum Credit Requirement</th>
<th>51 credits</th>
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<tbody>
<tr>
<td>Residence Credit Requirement</td>
<td>32 credits</td>
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</table>

Minimum Graduate Coursework Requirement:
The minimum graduate coursework (50%) requirement states that at least 50% of credits applied toward the program’s graduate degree credit requirement must be courses designed for graduate work (this includes but is not limited to online, thesis/research, independent study, and practicum/internship credits). For the agronomy department that is 26 credits.

The official University documentation of “graduate level” coursework is identified with the graduate course attribute (G50%) in the University’s Course Guide and Class Search (https://public.my.wisc.edu/webExpanded).

Overall Graduate GPA Requirement:
3.00 GPA required.

Other Grade Requirements:
The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.

REQUIRED COURSES

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>1 year of general chemistry with labs</td>
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<td>1 semester of organic chemistry with labs</td>
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<tr>
<td>genetics</td>
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<tr>
<td>plant morphology, anatomy, or physiology</td>
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<tr>
<td>taxonomy, evolution, or ecology</td>
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<tr>
<td>Two semesters of one or both of the following:</td>
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<tr>
<td>AGRONOMY 920 Seminar</td>
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<tr>
<td>AGRONOMY GENETICS/ HORT 957 Seminar-Plant Breeding</td>
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Assessments and Examinations:
Doctoral students are required to take a comprehensive preliminary/oral examination after they have cleared their record of all Incomplete and Progress grades (other than research and dissertation).

As a Ph.D. student you must take your final oral exam within five years of passing the prelim or you will be required to take another preliminary examination and be admitted to candidacy for a second time. All Ph.D. candidates are required to present an exit seminar. This often is most convenient just prior to the final examination, or you may present the seminar as part of the Agronomy Colloquium. The final examination ordinarily covers your dissertation and the general fields of your major and minor studies.

Deposit of the doctoral dissertation in the Graduate School is required.

Language Requirements:
The agronomy department does not have any language requirements.

Doctoral Minor/Breadth Requirements:
Students completing a Ph.D. in agronomy must also complete requirements for a minor in another department.

The course work for completion of the minor requirement is decided at the time of certification, with approval of the minor advisor. The minor department sets the requirements for minor completion. In both options, one course cross-listed with the major may be used for the minor, so long as it is staffed by the minor department and is not applicable to any requirements of the major.

The type and completion of the minor is reported to the Graduate School on the preliminary examination warrant.

These classes can be taken in your undergraduate or master’s career. At the department’s discretion, you may be admitted with deficiencies. These deficiencies are expected to be completed within the first semester of study. The Agronomy Department requires two full-time semesters in residence for a Ph.D. Your certification committee can petition.
the Graduate Studies Committee for a deviation from the residence requirement under unique circumstances.

Teaching experience is not required, but is highly recommended by the department and the time for completion of this recommended experience should be included on the certification form.

Policies

Graduate School Policies
The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

Major-Specific Policies

Graduate Program Handbook
The Graduate Program Handbook (http://agronomy.wisc.edu/graduate-handbook) is the repository for all of the program’s policies and requirements.

Prior Coursework

Graduate Work from Other Institutions
For well-prepared advanced students, the program may accept up to 12 credits of prior graduate coursework from other institutions toward the minimum graduate degree credit and minimum graduate coursework (50%) requirement. The minimum graduate residence credit requirement can be satisfied only with courses taken as a graduate student at UW–Madison.

UW–Madison Undergraduate
For well-prepared advanced students, the program may decide to accept up to 7 credits numbered 300 or above completed at UW–Madison toward fulfillment of minimum degree and minor credit requirements. This work would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above.

UW–Madison University Special
The program may decide to accept up to 12 University Special student credits as fulfillment of the minimum graduate residence, graduate degree, or minor credit requirements on occasion as an exception (on a case-by-case basis). UW–Madison coursework taken as a University Special student would not be allowed to count toward the 50% graduate coursework minimum unless taken at the 700 level or above.

Probation
If students were admitted on probation and they satisfy the conditions outlined at the time of admission, probationary status will be removed automatically. Once their studies have begun, students are expected to make satisfactory progress toward their degree.

Students must be in good academic standing with the Graduate School, their program, and their advisor. The Graduate School regularly reviews the record of any student who received grades of BC, C, D, F, or I in courses numbered 300 or above, or grades of U in research and thesis. This review could result in academic probation with a hold on future enrollment, and the student may be suspended from graduate studies.

The Graduate School may also put students on probation for incompletes not cleared within one term. All incomplete grades must be resolved before a degree is granted.

Advisor / Committee
Every graduate student is required to have an advisor. To ensure that students are making satisfactory progress toward a degree, the student is expected to meet with their advisor on a regular basis. The advisor is a faculty member, or sometimes two members, from Agronomy responsible for providing advice regarding graduate studies.

Students are usually admitted to the agronomy department directly into the mentorship of a specific advisor, without completing any rotations.

You are required to form, under the guidance of your advisor, a committee to oversee your Ph.D. degree progress. The four or five committee members are faculty of the agronomy department and related departments. The department requires that at least one of the four committee members comes from another department. While not strictly required, continuity in membership of the student’s Certification Committee, Preliminary Examination Committee, and Final Examination Committee is strongly encouraged. At least three committee members of all doctoral/final oral examination committees must be designated as readers.

Credits Per Term Allowed
The Graduate School considers full-time enrollment to be 8–15 graded credits taken at 300 or above, excluding pass/fail and audit, during the fall and spring semesters, and 4–12 credits during the summer term. If students elect not to enroll as full-time students as defined by the Graduate School, they are responsible for knowing about possible obligations that may require full-time status. Such obligations may include visa eligibility, fellowships, assistantships, financial aid, external funding agencies, and program satisfactory progress requirements.

Dissertators take exactly 3 credits per semester.

Time Constraints
Doctoral degree students who have been absent for ten or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

A candidate for a doctoral degree who fails to take the final oral examination and deposit the dissertation within five years after passing the preliminary examination may be required to take another preliminary examination and to be admitted to candidacy a second time.

Other
n/a
PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School's professional development resources (https://grad.wisc.edu/pd) to build skills, thrive academically, and launch your career.

PROGRAM RESOURCES
The agronomy department does not require but encourages all students to complete an Individual Development Plan (IDP). As you begin your Graduate School career, an Individual Development Plan (IDP) is an essential tool to help you:

1. Assess your current skills and strengths
2. Make a plan for developing skills that will help you meet your academic and professional goals
3. Communicate with your advisors and mentors about your evolving goals and related skills.

For graduate students in the natural sciences and engineering, the American Association for the Advancement of Science (AAAS) online tool provides a comprehensive set of materials and exercises that will guide you through the process of self-assessment, career exploration, goal-setting, and implementation of your plan. Set up a free account to create and monitor your IDP at myidp.sciencecareers.org.

The UW-Madison IDP template (https://grad.wisc.edu/pd/idp), which includes instructions and examples, is flexible and appropriate for all disciplines.

LEARNING OUTCOMES
1. Articulates research problems, potentials, and limits with respect to theory, knowledge, or practice within the field of study.
2. Formulates ideas, concepts, designs, and/or techniques beyond the current boundaries of knowledge within the field of study.
3. Creates research, scholarship, or performance that makes a substantive contribution.
4. Demonstrates breadth within their learning experiences.
5. Advances contributions of the field of study to society.
6. Communicates complex ideas in a clear and understandable manner.
7. Fosters ethical and professional conduct.

PEOPLE

ADMINISTRATION
Chris Kucharik, Chair
Shawn Conley and Natalia De Leon, Associate Chairs
Sandra Bennett, Department Administrator

PROGRAM FACULTY AND THEIR AREAS OF STUDY
Ken Albrecht, Professor - Forages and Grazing Systems
Jean-Michel Ané, Professor - Plant-Microbe Symbioses
Shawn Conley, Professor - Soybean & Small Grain Production
Natalia De Leon, Professor - Plant Breeding and Plant Genetics
Stan Duke, Professor - Barley Malt Quality
Lucía Gutiérrez, Assistant Professor - Cereal Crops Breeding
Cynthia Henson, Professor - Plant Physiology
Randy Jackson, Professor - Grassland Ecosystems, Agroecology
Molly Jahn, Professor - Risk in Food Systems
Heidi Kaeppler, Associate Professor - Cereal Crops Genetics
Shawn Kaeppler, Professor - Plant Breeding and Plant Genetics
Chris Kucharik, Professor - Ecosystems, Land Management, Biogeochemical Cycling
Joe Lauer, Professor - Crop Management (Corn)
Mali Mahalingam, Assistant Professor - Plant Genomics, Stress Physiology
Valentín Picasso, Assistant Professor - Forages and Grazing Systems, Agroecology, Sustainable Agriculture
Mark Renz, Associate Professor - Weed Science
David Stoltenberg, Professor - Cropping Systems, Weed Science, Agroecology, Sustainable Agriculture
Bill Tracy, Professor - Plant Breeding and Plant Genetics (Sweet Corn)
Dan Undersander, Professor Forages and Grazing Systems
Rodrigo Werle, Assistant Professor - Extension Cropping Systems, Weed Scientist

For full descriptions of each faculty's research interests, see their individual pages on the Agronomy website (http://www.agronomy.wisc.edu).