PLANT BREEDING AND PLANT GENETICS, PHD

The program leading to the Doctor of Philosophy in Plant Breeding and Plant Genetics provides a broad exposure in the various disciplines involved with plant improvement. The program is truly interdisciplinary with faculty participants from agronomy, biochemistry, botany, entomology, genetics, horticulture, plant pathology, and statistics. Research areas include biochemical and molecular genetics, bioinformatics, biometry, cytogenetics and cytology, genecology, genetics, plant breeding, and quantitative genetics.

The Plant Breeding and Plant Genetics Program has been designated a UW System Center of Excellence. The 50–60 students majoring in the program come from throughout the United States and all over the world. Faculty have included members of the National Academy of Sciences, endowed chair professors, and recipients of the National Council of Plant Breeders "Genetic and Plant Breeding Award." The University of Wisconsin leads the nation in the diversity of plant breeding programs and number of graduate students trained. Graduates are found in responsible positions with academic institutions, research institutions, and private companies involved in molecular to cultivar development work.

ADMISSIONS

Please consult the table below for key information about this degree program’s admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program’s website.

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

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>September 1</td>
</tr>
<tr>
<td>Summer Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Not required.</td>
</tr>
<tr>
<td>English Proficiency Test</td>
<td>Every applicant whose native language is not English, or whose undergraduate instruction was not exclusively in English, must provide an English proficiency test score earned within two years of the anticipated term of enrollment. Refer to the Graduate School: Minimum Requirements for Admission policy: <a href="https://policy.wisc.edu/library/UW-1241">https://policy.wisc.edu/library/UW-1241</a> (<a href="https://policy.wisc.edu/library/UW-1241/">https://policy.wisc.edu/library/UW-1241/</a>).</td>
</tr>
<tr>
<td>Other Test(s) (e.g., GMAT, MCAT)</td>
<td>n/a</td>
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</tbody>
</table>

Satisfactory preparation for graduate study in Plant Breeding and Plant Genetics includes undergraduate coursework in mathematics through differential and integral calculus, general chemistry and organic chemistry, physics, and a comprehensive biology sequence that covers both plant and animal biology and includes labs. Some of this preparatory coursework may be completed during the first year of graduate study. Normally, applicants will have had undergraduate training in the biological or agricultural sciences. All applicants must fulfill the minimum entrance requirements of the Graduate School.

APPLICATION CHECKLIST

A complete application should include the following items:

1. Graduate School Application: We only accept applications submitted online through the Graduate School.
2. Supplementary Application: The supplementary application will appear as a part of the Graduate School’s electronic application once the applicant selects Plant Breeding and Plant Genetics.
3. Application Fee: Instructions for paying the application fee are available through the Graduate School’s online application form.
4. Statement of Purpose: Your essay should be a concise description of your reasons for choosing to study Plant Breeding and Plant Genetics at the University of Wisconsin. Please include your research interests and career goals as well as a description of your preparation for graduate study including relevant coursework, related employment, research experience, publications, presentations, awards, and honors.
5. Transcripts: We require all applicants to submit an unofficial transcript in PDF format to their online application. If an applicant is recommended for admission, then they will be required to submit their official transcript to the Graduate School. International academic records must be submitted in the original language and accompanied by an official English translation. Documents must be issued by the institution with an official seal/stamp and an official signature.
6. Three Letters of Recommendation, with at least two from academic sources.
7. Proof of English Proficiency: Applicants, whose native language is not English, or whose undergraduate instruction was not in English, must follow the Graduate School’s requirements (https://grad.wisc.edu/apply/requirements/) for proof of English proficiency.

APPLICATION PROCESS

At this time, the graduate program in Plant Breeding and Plant Genetics does not support lab rotations. Applicants are admitted directly into a specific research program with one major professor. Admissions decisions are contingent upon the acceptance of an applicant by a faculty mentor. Because we receive many more applications from qualified applicants than we are able to admit, we highly recommend that applicants directly contact any faculty members with whom they are interested in working.
**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 restrictions related to funding.

**PROGRAM RESOURCES**
Financial support may be available through research assistantships (RAs) or fellowships. Fellowships are granted to students with very outstanding academic records. We recommend that your application be complete by the application deadlines in order to be considered for funding. Research assistantships are awarded by individual professors through funds available to their research programs.

Please be advised that you do not need to make a separate application for financial support as your admission application will also serve as an application for assistantships and fellowships.

**REQUIREMENTS**

**MINIMUM GRADUATE SCHOOL REQUIREMENTS**
Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/policiesandrequirementstext), in addition to the program requirements listed below.

**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>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW-Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

**CURRICULAR REQUIREMENTS**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit Requirement</td>
<td>51 credits</td>
</tr>
<tr>
<td>Minimum Residence Credit Requirement</td>
<td>32 credits</td>
</tr>
</tbody>
</table>
| Minimum Graduate Coursework | 26 credits must be graduate-level coursework. Refer to the Graduate School: Minimum Graduate Coursework (50%) Requirement policy: https://policy.wisc.edu/library/UW-1244/.
| Overall Graduate GPA Requirement | 3.00 GPA required. Refer to the Graduate School: Grade Point Average (GPA) Requirement policy: https://policy.wisc.edu/library/UW-1203/.
| Other Grade Requirements | PhD candidates should maintain a 3.0 GPA in all core curriculum courses and may not have any more than two Incompletes on their record at any one time.

**Assessments and Examinations**

Doctoral students must pass both the oral preliminary and final thesis exams.

**REQUIRED COURSES**

The specific program of study toward a doctoral degree is developed by the student and their major professor. Considerable flexibility in the selection of courses is permitted to meet the needs and interests of the candidate. Of the required 51 credits, students must complete a minimum of 17 credits of coursework (not research credit) and at least 11 credits must come from the Core Curriculum, including at least 2 credits in each of Sections A, B, and C. Students must also complete 3 credits of Plant Breeding seminar (HORT/AGRONOMY/GENETICS 957 Seminar–Plant Breeding).
**Core Curriculum**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Plant Breeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HORT/AGRONY 501</td>
<td>Principles of Plant Breeding</td>
<td>3</td>
</tr>
<tr>
<td>HORT/AGRONY 502</td>
<td>Techniques of Plant Breeding</td>
<td>1</td>
</tr>
<tr>
<td>HORT/AGRONY 812</td>
<td>Selection Theory for Quantitative Traits in Plants</td>
<td>2</td>
</tr>
<tr>
<td>B. Genetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HORT/GENETICS 550</td>
<td>Molecular Approaches for Potential Crop Improvement</td>
<td>3</td>
</tr>
<tr>
<td>AGRONY/AN SCI/GENETICS/</td>
<td>Genetic Mapping</td>
<td>3</td>
</tr>
<tr>
<td>HORT 615</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL PATH 517</td>
<td>Plant Disease Resistance</td>
<td>2-3</td>
</tr>
<tr>
<td>GENETICS/BIOCHEM 631</td>
<td>Plant Genetics and Development</td>
<td>3</td>
</tr>
<tr>
<td>GENETICS/BIOCHEM/BOTANY</td>
<td>Regulatory Mechanisms in Plant Development</td>
<td>3</td>
</tr>
<tr>
<td>840</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Quantitative Genetics and Biometry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HORT/F&amp;W ECOL/STAT 572</td>
<td>Statistical Methods for Bioscience II</td>
<td>4</td>
</tr>
<tr>
<td>HORT/AGRONY 811</td>
<td>Biometrical Procedures in Plant Breeding</td>
<td>3</td>
</tr>
<tr>
<td>AGRONY 771 &amp; AGRONY 772</td>
<td>Experimental Designs and Applications in ANOVA</td>
<td>2</td>
</tr>
<tr>
<td>AN SCI 865</td>
<td>Design and Analysis of Biological Studies</td>
<td>4</td>
</tr>
<tr>
<td>D. Additional Core Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL PATH/BOTANY/ENTOM 505</td>
<td>Plant-Microbe Interactions: Molecular and Ecological Aspects</td>
<td>3</td>
</tr>
<tr>
<td>BIOCHEM/BOTANY 621</td>
<td>Plant Biochemistry</td>
<td>3</td>
</tr>
<tr>
<td>GENETICS 633</td>
<td>Population Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BOTANY 500</td>
<td>Plant Physiology</td>
<td>3-4</td>
</tr>
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**Undergraduate Credits Earned at Other Institutions or UW-Madison**

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

**Credits Earned as a Professional Student at UW-Madison (Law, Medicine, Pharmacy, and Veterinary careers)**

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

**Credits Earned as a University Special Student at UW-Madison**

Refer to the Graduate School: Transfer Credits for Prior Coursework (https://policy.wisc.edu/library/UW-1216/) policy.

**PROBATION**

Refer to the Graduate School: Probation (https://policy.wisc.edu/library/UW-1217/) policy.

**ADVISOR / COMMITTEE**


**CREDITS PER TERM ALLOWED**

15 credits

**TIME LIMITS**

Refer to the Graduate School: Time Limits (https://policy.wisc.edu/library/UW-1221/) policy.

**GRIEVANCES AND APPEALS**

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (https://doso.students.wisc.edu/bias-or-hate-reporting/)
- Graduate Assistantship Policies and Procedures (https://hr.wisc.edu/policies/gapp/#grievance-procedure)
- Hostile and Intimidating Behavior Policies and Procedures (https://hr.wisc.edu/hib/)
  - Office of the Provost for Faculty and Staff Affairs (https://facstaff.provost.wisc.edu/)
  - Employee Assistance (http://www.eao.wisc.edu/) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
  - Employee Disability Resource Office (https://employeedisabilities.wisc.edu/) (for qualified employees or applicants with disabilities to have equal employment opportunities)
  - Graduate School (https://grad.wisc.edu/) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
  - Office of Compliance (https://compliance.wisc.edu/) (for class harassment and discrimination, including sexual harassment and sexual violence)
  - Office Student Assistance and Support (OSAS) (https://osas.wisc.edu/) (for all students to seek grievance assistance and support)
College of Agricultural and Life Sciences: Grievance Policy

In the College of Agricultural and Life Sciences (CALS), any student who feels unfairly treated by a member of the CALS faculty or staff has the right to complain about the treatment and to receive a prompt hearing. Some complaints may arise from misunderstandings or communication breakdowns and be easily resolved; others may require formal action. Complaints may concern any matter of perceived unfairness.

To ensure a prompt and fair hearing of any complaint, and to protect the rights of both the person complaining and the person at whom the complaint is directed, the following procedures are used in the College of Agricultural and Life Sciences. Any student, undergraduate or graduate, may use these procedures, except employees whose complaints are covered under other campus policies.

1. The student should first talk with the person at whom the complaint is directed. Most issues can be settled at this level. Others may be resolved by established departmental procedures.

2. If the student is unsatisfied, and the complaint involves any unit outside CALS, the student should seek the advice of the dean or director of that unit to determine how to proceed.
   a. If the complaint involves an academic department in CALS the student should proceed in accordance with item 3 below.
   b. If the grievance involves a unit in CALS that is not an academic department, the student should proceed in accordance with item 4 below.

3. The student should contact the department’s grievance advisor within 120 calendar days of the alleged unfair treatment. The departmental administrator can provide this person’s name. The grievance advisor will attempt to resolve the problem informally within 10 working days of receiving the complaint, in discussions with the student and the person at whom the complaint is directed.
   a. If informal mediation fails, the student can submit the grievance in writing to the grievance advisor within 10 working days of the date the student is informed of the failure of the mediation attempt by the grievance advisor. The grievance advisor will provide a copy to the person at whom the grievance is directed.
   b. The grievance advisor will refer the complaint to a department committee that will obtain a written response from the person at whom the complaint is directed, providing a copy to the student. Either party may request a hearing before the committee. The grievance advisor will provide both parties a written decision within 20 working days from the date of receipt of the written complaint.
   c. If the grievance involves the department chairperson, the grievance advisor or a member of the grievance committee, these persons may not participate in the review.
   d. If not satisfied with departmental action, either party has 10 working days from the date of notification of the departmental committee action to file a written appeal to the CALS Equity and Diversity Committee. A subcommittee of this committee will make a preliminary judgement as to whether the case merits further investigation and review. If the subcommittee unanimously determines that the case does not merit further investigation and review, its decision is final. If one or more members of the subcommittee determine that the case does merit further investigation and review, the subcommittee will investigate and seek to resolve the dispute through mediation. If this mediation attempt fails, the subcommittee will bring the case to the full committee. The committee may seek additional information from the parties or hold a hearing. The committee will present a written recommendation to the dean who will provide a final decision within 20 working days of receipt of the committee recommendation.

4. If the alleged unfair treatment occurs in a CALS unit that is not an academic department, the student should, within 120 calendar days of the alleged incident, take his/her grievance directly to the Associate Dean of Academic Affairs. The dean will attempt to resolve the problem informally within 10 working days of receiving the complaint. If this mediation attempt does not succeed the student may file a written complaint with the dean who will refer it to the CALS Equity and Diversity Committee. The committee will seek a written response from the person at whom the complaint is directed, subsequently following other steps delineated in item 3d above.

OTHER

Financial support may be available through research assistantships (RAs) or fellowships. Fellowships are granted to students with very outstanding academic records. We recommend that your application be complete by the application deadlines in order to be considered for funding. Research assistantships are awarded by individual professors through funds available to their research programs.

LEARNING OUTCOMES

LEARNING OUTCOMES

1. Articulates research problems, potentials, and limits with respect to knowledge within the field of plant breeding and plant genetics.
2. Formulates ideas, concepts, designs, and/or techniques beyond the current boundaries of knowledge within the field of plant breeding and plant genetics.
3. Creates research that makes a substantive contribution to the field of plant breeding and plant genetics.
4. Communicates complex ideas in a clear and understandable manner.
5. Recognizes and applies principles of ethical and professional conduct.

**PEOPLE**

Up-to-date faculty listings (https://plantbreeding.wisc.edu/faculty/faculty-by-name/) can be found on our website.