



Plant Breeding and Plant Genetics Program

University of Wisconsin - Madison

Center of Excellence



General description:

The Plant Breeding and Plant Genetics (PBPG) Center of Excellence at the University of Wisconsin-Madison leads the nation in the number of plant breeding programs and number of graduate students trained (Grunner and Wehner, 2003). The UW PBPG program leading to the Master of Science or the Doctor of Philosophy in Plant Breeding and Plant Genetics provides broad exposure in the various disciplines involved in plant breeding and plant genetics and also allows for specialization in a particular area of study. PBPG faculty have included five members of the National Academy of Sciences (Amasino, Doebley, Nelson, Peloquin, Sequeira), a number of endowed chair professors, recipients of the National Council of Plant Breeders "Genetic and Plant Breeding Award", ASMS Excellence in Vegetable Breeding, a recipient of the Assinzel Prize from the International Association of Plant Breeders among others.

The program is truly interdisciplinary, with membership from the Departments of Agronomy, Botany, Biochemistry, Genetics, Horticulture, Plant Pathology, Forest Ecology and Management, and Statistics. Research areas include biochemical and molecular genetics, biometry, quantitative genetics, cytogenetics and cytology, gene ecology, genetics, and plant breeding.

The 50-60 students majoring in plant breeding and plant genetics come from throughout the United States and all over the world. Graduates are found in responsible positions with academic institutions, research institutions, and private companies involved in molecular to cultivar development work. International students that have graduated from this program have returned to work for universities, governmental institutes and industries in their native countries. Several of our graduates are also working in international centers and institutes across the globe.



PBPG Core Curriculum:

1. Plant Breeding

- Hort/Agron 501 - Principles of Plant Breeding (3 cr)
- Hort/Agron 502 - Techniques of Plant Breeding (1 cr)
- Forestry 640 - Forest Tree Genetics (2 cr)
- Agron/Hort 850 - Advanced Plant Breeding (3 cr)



2. Genetics and Cytogenetics

- Hort/Agron 561 - Introductory Cytogenetics (3 cr)
- Genetics 631 - Plant Genetics (3 cr)
- Agron/Hort 861 - Chromosome Manipulation in Plants (2 cr)
- Genetics 701 - Advanced Genetics (2 cr)

3. Plants and Their Environment

- Plant Path 505 - Plant-Microbe Interactions: Mol. & Ecol. Aspects (3 cr)
- Plant Path 517 - Plant Disease Resistance (3 cr)
- Plant Path 618 - Genetics of Plant Host-Parasite Interactions (2 cr)
- Agron/Hort 875 - Evolution and Domestication (3 cr)
- Botany 563 - Molecular Approaches in Plant Evolution & System. (3 cr)
- Botany 828 - Evolutionary Plant Ecology (3 cr)

4. Quantitative Genetics and Biometry

- Agron 771 - Experimental Designs (1cr)
- Agron 772 - Applications in ANOVA (1 cr)
- Agron/Hort 811 - Biometrical Procedures in Plant Breeding (3 cr)
- Agron/Hort 812 - Selection Theory for Quantitative Traits in Plants (3 cr)
- Genetics 629 - Population Genetics (3 cr)

5. Biochemical and Molecular Genetics

- Hort 550 - Molecular Approaches for Potential Crop Improvement (3 cr)
- Botany 840 - Regulatory Mechanisms in Plant Development (3 cr)
- Agron/Hort 875 - Plant Physiology & Biochemical Genetics (2 cr)
- Biochemistry 621 - Plant Biochemistry (3 cr)
- Genetics 603 - Eukaryotic Molecular Biology (2 cr)

History of Plant Breeding and Plant Genetics Group:

In the mid-1960s, a group of 20 faculty from the Departments of Agronomy, Botany, Forestry, Genetics, Horticulture and Plant Pathology organized the University of Wisconsin (UW) Plant Breeding and Plant Genetics (PBPG) Program. All members voted to elect the first chairman of this group for two-year terms. The executive committee is comprised of one member of each of the founding Departments. Members were appointed by the chairman of each of those six Departments.

The UW Graduate School and Board of Regents approved the proposal for a graduate program with M.S. and Ph.D. degrees in PBPG in 1968.

Faculty (*ARS-USDA faculty):

Department of Agronomy

Jean-Michel Ane; Michael D. Casler*; James G. Coors; Natalia de Leon; Molly Jahn; Heidi Kaepler; Shawn Kaepler; William F. Tracy



Department of Biochemistry

Richard Amasino; Michael R. Sussman

Department of Botany

David A. Baum; Donald M. Waller



Department of Forest Ecology and Management

Raymond Guries

Department of Genetics

John Doebley; Patrick H. Masson; Richard Vierstra



Department of Horticulture

John B. Bamberg*; Johanne Brunet*; Irwin L. Goldman; Michael J. Havey*; Jiming Jiang; Shelley Jansky*; Richard Lower; James Nienhuis; Sara Patterson; Philipp Simon*; David M. Spooner*; Jack E. Staub*; Dennis Stimart;



Department of Plant Pathology

Andrew F. Bent; Craig R. Grau; Dennis Halterman*; Sally A. Leong*; Douglas I. Rouse

Department of Statistics

Brian S. Yandell

Breeding effort by crop

Crop	PY*	Released in the past 5 years	
		Germplasm	Cultivars
alfalfa	v	-	-
barley	v	-	-
bean	v	v	v
beet	v	v	v
capsicum	v	v	v
carrot	v	v	v
cranberries	v	v	v
cucumber	v	v	v
elm	v	-	-
field corn	v	v	v
forage grasses	v	-	-
garlic	v	v	-
leek	v	v	-
liatris	v	-	v
melon	v	v	v
oat	v	-	v
onion	v	v	v
poplar	v	-	-
potato	v	-	v
pumpkin	v	v	v
rice	v	-	-
snapdragon	v	-	v
soybeans	v	v	-
squash	v	v	-
sweet corn	v	v	v
swiss chard	v	-	-
switchgrass	v	v	v
tomato	v	v	v
turfgrass	v	-	-
wheat	v	-	-

v indicate effort or releases
- indicates no releases in last five years



Statistics:

Current number of students = 57	
16 MS	41 PhD
Number of students 2000-2006 = 70	
24 MS	46 PhD
Gender of current students (No.)	
26 female	31 male
Origin of current students (No.)	
24 international	33 domestic

Job Placement of Recent Graduates (2000 – 2006):

