



Faculty in the Departments of Agronomy, Botany and Plant Pathology, Forestry and Natural Resources, Horticulture and Landscape Architecture, and USDA-ARS, U.S. Forest Service, and the Hardwood Tree Improvement and Regeneration Center contributed information for the preparation of this poster.

Abstract: There are strong and active plant breeding and genetics research programs in the Departments of Agronomy, Horticulture and Landscape Architecture, and Forestry and Natural Resources, including programs with significant collaboration among University and USDA-ARS scientists. Crops include maize, mint, oat, sorghum, soybean, tomato, wheat, tree fruits, and native hardwoods; with germplasm and commercial cultivar development in certain crops. Research teams include applied plant breeders, molecular geneticists, and researchers in related disciplines (e.g., plant pathology, entomology, statistics, quantitative and population genetics, food science, and bioinformatics). A very successful undergraduate option, Plant Genetics and Breeding, typically has 20 to 25 students (freshmen – seniors), all of whom carry out summer internship programs in the seed industry and many who work part-time in various plant breeding and genetics research programs during the school year, both on campus and in seed industry plant breeding programs. All BS graduates have been placed in positions in the seed industry, or are continuing their education at the graduate level in various major universities. There are active graduate education programs at the MS and PhD levels in all of the plant breeding and genetics research areas. Graduates are very competitive and essentially all have been placed in industry, academic careers, or governmental positions. Graduate students also participate in internship programs with various industry plant breeding programs. Course offerings include three plant breeding courses in Agronomy, a variety of undergraduate and graduate courses in genetics, genomics, quantitative and population genetics, several courses in statistics and bioinformatics; as well as many courses in related disciplines.

Table 1. Plant Breeding and Genetics efforts by activity.

Activity	PYs ¹	% ²
a. Plant Breeding Research	2.05	8.2
b. Germplasm Enhancement	1.80	7.2
c. Cultivar Development	2.75	11.0
d. Biotechnology Res. & Development ³	15.25	61.2
e. Plant Breeding Education	0.95	3.8
f. Genetics Education ⁴	2.15	8.6
g. Other ⁵	3.55	-----
Total	28.45	100

¹Sum of efforts by faculty who indicated at least 0.05 PY (person year) effort in a, b, c, or e.

²Percentage of the sum of PYs in a – f (24.95).

³Sum of efforts by faculty who indicated at least 0.05 PY effort in a, b, c, or e. Other faculty in the Colleges of Agriculture and Science carry out basic plant research not focused on specific crops.

⁴Effort by faculty who indicated at least 0.05 PY effort in a, b, c, or e. In addition to this effort, other faculty in Agriculture and the College of Science contribute to genetics instruction.

⁵Sum of efforts by faculty contributing to a – f, in efforts other than a – f, such as research in related areas of science, international efforts, administrative, etc.).

Table 2. Breeding and Genetics efforts by crop.

Crop	PYs	Releases: 2001-2006	
		Germplasm	Cultivars
Apple	0.15		3
Arugula	0.05		1
Pear	0.05		2
Black Walnut	3.95		3
Black Cherry	1.50		2
Poplar	0.50		
Maize	1.85		
Mint	0.60		
Oat	0.35		3
Sorghum	0.80		36 ¹
Soybean	2.80		3
Tomato	0.60		
Winter Wheat	2.95	2	10
Other ²	5.70		
Total	21.85		

¹These are 16 pairs of A- and B-lines and 4 R-lines for production of hybrids.

²Biotechnology/genetics research focusing on pathogens/pests and model plant species by faculty contributing to a, b, c, or e in Table 1.

Plant Breeding Course Offerings

Department of Agronomy:

AGRY520. Principles & Methods of Plant Breeding. 3 semester credits: 2 lectures, one 2-hour lab per week. Required for undergraduates in the Plant Genetics and Plant Breeding option in Agronomy; and intended for incoming MS graduate students. Offered in Spring Semesters.

AGRY550. Crops Breeding Techniques. 2 semester credits: Hands-on experiences in plant breeding programs at Purdue and in several industry programs in central Indiana involving plant breeding discussions, plant hybridization and selection in several crop species. Offered in summers.

AGRY605. Advanced Plant Breeding. 3 semester credits: 3 lectures per week. Emphasis on literature in various aspects of plant breeding of self- and cross-fertilizing crop species, and applications of relevant biotechnologies to crop improvement. Offered alternating Fall Semesters.

AGRY598. Special Problems. Variable credit hours. To provide opportunities for undergraduate students and graduate students to intern in industry plant breeding programs to gain in-depth hands-on experience in various aspects of crop improvement. This course has been highly effective and has received excellent evaluations by students and collaborating programs in the seed industry.

Institutional commitment: Purdue University is fully committed to provide excellent and relevant education and training in Plant Breeding and Plant Genetics at the undergraduate and graduate levels. This education features learning opportunities in cutting-edge developments in sciences and technologies, to prepare students for careers in industry, academia, and in the US and international settings.

We are in process of hiring persons in two new positions, Dept of Agronomy:

1) FL Patterson Chair position in Translational Genomics

2) Soybean Genetics

Recently hired:

3) Research Geneticist, Soybean – USDA-ARS

Table 3. Advanced-degree students in Plant Breeding/Genetics

Completed degrees in 2001 to 2006			
PhD		MS	
US	International	US	International
14	17	8	3
Current types of positions			
Industry (6)		Industry (4)	
ARS (1)		ARS (1)	
University (12)		University (2)	
Natl Program (7)		PhD (4)	
CGIAR (IITA) (1)			
Postdoc (4)			
Current students			
PhD		MS	
US	International	US	International
10	10	9	2

For curricular information about learning opportunities at Purdue University, log onto the following websites:

Agronomy: <http://www.agry.purdue.edu>

Biological Sciences: <http://www.biology.purdue.edu>

Botany and Plant Pathology: <http://www.btny.purdue.edu>

Forestry and Natural Resources:

<http://www.agriculture.purdue.edu/fnr/html/graduate.html>

Horticulture and Landscape Architecture: <http://www.hort.purdue.edu>