

Plant breeding efforts by crop

Crop Group	Release in the past 5 years		
	Yr	Genp. hem.	Cultivars
Wheat	23	0	5
Barley	12	0	2
Lentils	10	0	15
Oleifers (Medicinal)	08	0	1
Vegetable	10	0	2
Forage	10	0	7
Forest Trees	30	N/A*	N/A
Total	103	0	32

*Note: see Improvement records to progress population improvement. It is not possible to track the initial release of germplasm from one culture. For lentils, not tracked 6-8% small flake, hope are great breeding. For trees see 10/04.

Plant breeding efforts by activity

Activity	Yr	9b
Plant Breeding Research	0.9	8
Genp. hem. Enhancement	3.8	34
Cultivar Development	3.6	31
Biotechnology Research and Development	2.0	18
Plant Breeding Education	1.0	9
Total	11.3	100b

Rationale for breeding programs at Oregon State University, and future plans

Agriculture in the Pacific Northwest (PNW) supports many high value specialty crops. Unlike traditional row crops, these crops are difficult to grow elsewhere. In addition to grains and legumes, specialty crops such as tulips, nuts, vegetable oils for processing and fresh market, and vegetable, forage, and grass for seed are extensively grown. The cool Mediterranean climate is unique to the PNW, and crops may require special adaptation. Growing conditions are excellent and pests and crop failures are rare. The relatively high cost of inputs (labor and water) compared to the Midwest favors specialty crops over commodities.

Reflecting the diversity of the PNW, plant breeding programs at OSU are mostly centered on crops that have little private sector breeding activity. The one exception is Douglas-fir, which has one of the largest private/public sector tree breeding programs in the world. In addition to the university supported breeding programs, USDA-ARS has plant breeding and germplasm enhancement programs based at OSU that breed small tulip (bluebellies, cone tulip, and snowbellies), hops, and forage grasses. As such, OSU has one of the most diverse applied breeding programs in North America. Several breeders (hazelnuts, hops, meadowlark, Douglas-fir) have tertiary counterparts on the continent. Well organized commodity commission administrators compete for funds for public research and provide a means to obtain research grant for applied research. The region is a major area for seed production of many field and vegetable crops, which provides an additional concentration of professionals and infrastructure that typically interface with plant breeders. Breeding efforts at OSU impact the entire PNW and are highly collaborative with Washington State University, University of Idaho and USDA-ARS. OSU wheat varieties are widely grown in WA and ID, and public breeding is a collaborative interstate effort.

In the long run, most OSU breeding programs will maintain an applied focus to their research. A top priority for Horticulture is to hire an ornamental plant breeder to support the nursery industry, the largest agricultural industry in the state. In Crop Science, replacing the diverse specialty crop gene banks is a high priority.

Jobs in the private sector, with some placements abroad, grant universities. Graduates work at crop-specific breeders, seed companies including Monsanto, Seminis, Sakata, and Syngenta, and vertically integrated food and beverage companies such as Coca-Cola. In the public sector, graduates have been placed at USDA-ARS, CMMRT, and INRI in Uruguay. About 1/3 to 1/2 of graduates continue as foreign and return to their country of origin upon graduation. We find that plant breeding graduates from OSU are in demand by private seed companies, and as other public institutions have cut back on plant breeding activities, or converted positions to biotechnology positions, demand has increased. Student from OSU are trained in a wide range of plant breeding and molecular techniques within programs emphasizing applied field plant breeding. Private seed companies find these students from OSU have the skills to administer plant breeding program without research training.

Plant Breeding and Genetics Courses

*Core Courses:

Plant Breeding and Genetics
 CSSM 501 RT 533 (3) Plant Genetics
 FS 533 (3) Biotech. Ag., Food and Res. Issues
 FS 544 (3) Food Genetics
 HO RT 535 550 (4) Plant Breeding
 GEN 533 (3) Intro. Population Genetics
 HO RT 508 573 (4) Cytogenetics
 CSS 555 (3) Plant Chromosome Biology
 HO RT 511 (3) Plant Genetics
 CSS 620 (1) DNA Fingerprinting
 CSS 621 (1) Genetic Mapping
 CSS 622 (1) QTL Analysis

Statistics

ST 511 (4) Methods of Data Analysis
 ST 512 (4) Methods of Data Analysis
 ST 515 (3) Design and Analysis of Planned Experiments
 or CSS 550 (3) Field Plot Techniques

Biochemistry

BB 550 (4) and BB 551 (4)
 or BB 550 (3) and BB 551 (4)

Biotechnology

HO RT 541 (4) Plant Tissue Culture
 MC B 524 (1) Molecular and Cellular Biology Techniques
 MC B 525 (3) Techniques in Molecular and Cellular Biology
 or BB 554 (3) Biochemistry Laboratory
 MC B 555 (4) Molecular and Cellular Biology

*Other Relevant Courses:

HO RT 505B (1) Breeding Vegetatively Propagated Crops
 HO RT 512 (1) Crop Biomechanics
 HO RT 512 (1) Plant and Pesticide
 HO RT 513 (3) Plant Genetic Engineering
 CSS 630 (3) Advanced Plant Breeding I
 CSS 650 (3) Advanced Plant Breeding II
 MC B 554 (4) Molecular Genetics
 GEN 555 (4) Eukaryotic Molecular Genetics
 FS 523 (4) Natural Resource Data Analysis
 *Reading & conference course with rotating topics.

Plant breeding graduate students 2000 - 2006

	M.S.	Ph.D.	Total
Domestic	5	7	12
International	7	6	13
Total	12	13	25

Graduate students currently in training

	M.S.	Ph.D.	Total
Domestic	5	3	8
International	3	3	6
Total	8	6	14