

Plant Sciences/Horticulture

Program and Application Information

Department Head:	Dr. Richard Horsley
Graduate Coordinator:	Dr. Edward Deckard
Department Location:	166 Loftsgard Hall
Department Phone:	(701) 231-7971
Department Web Site:	www.ag.ndsu.edu/plantsciences/
Application Deadline:	International applications are due May 1st for Fall and August 1 for Spring. Domestic applicants should apply at least one month prior to the start of classes.
Degrees Offered:	Ph.D. (Plant Sciences only), M.S.
Test Requirement:	GRE
English Proficiency Requirements:	TOEFL iBT 71; IELTS 6

Program Description

The Department of Plant Sciences offers graduate studies leading to the M.S. degrees in Plant Sciences and Horticulture, and to a Ph.D. degree in Plant Sciences. Specialized academic and research training in Plant Sciences is available in plant breeding and genetics, weed science, biotechnology, field and forage crop production and management, and sports and urban turfgrass management. Areas of specialization in Horticulture and Forestry include breeding and genetics, biotechnology, physiology, propagation, and production and management of horticultural crops such as woody plants, potatoes, vegetables, and herbaceous ornamentals. Areas of specialization in cereal science may involve research in the areas of carbohydrates, enzymes, legumes, and other northern-grown crops; barley malting and brewing; wheat milling, baking, and pasta processing. Each study area is designed to provide students with a comprehension of the discipline and of relevant regional and global-community social issues.

The Department of Plant Sciences is located in Loftsgard Hall, completed in 1991, with modern and well-equipped research laboratories, offices for faculty and graduate students, and classrooms. Loftsgard Hall, which is part of the Plant Science Complex, provides a state-of-the-art facility for interdisciplinary research in plant sciences, ranging from basic studies and biotechnology to the more traditional applied areas. Facilities for cereal science research are located in Harris Hall. These facilities include analytical laboratories for grain quality research, baking, milling, malting and brewing, and pasta and noodle processing. State-of-the-art greenhouses and extensive growth chamber facilities are also available, as are 100 acres of field research land adjacent to the Plant Science Complex. An additional 500 acres of research land are located near the North Dakota State University campus. A horticultural farm only 25 miles west of campus has an extensive arboretum. Excellent supporting disciplines located nearby, or in the Plant Science Complex, include Soil Science, Botany, Cereal and Food Sciences, Biochemistry and Molecular Biology, Entomology, and Plant Pathology. The Department of Plant Sciences encourages interdisciplinary research, and students frequently tailor their research program to meet their interests by working with faculty in one or more of the supporting disciplines.

Graduate student numbers per faculty member are limited, so the student gets adequate personal attention and works closely with their adviser in research. Final selection of the adviser will be made on the basis of the student's interest, availability of space in the researcher's laboratory, and a common desire of the student and professor to work together. Not quite half of the graduate students are Ph.D. candidates.

Admission Requirements

The Department of Plant Sciences graduate programs are open to all qualified graduates of universities and colleges of recognized standing. To be admitted with full status to the program, the applicant must meet the Graduate School admission requirements.

Students who do not meet all requirements for admission, but show potential for successful graduate study, may be admitted under a conditional status. Evidence must be provided, showing that the applicant's potential is not adequately reflected by his/her record.

Financial Assistance

Research assistantships (half-time) are provided on a competitive basis, usually based on scholarship and potential to undertake advanced study and research. As of the 2014-15 academic year, the annual stipend generally is \$17,000 for an M.S. candidate and \$18,200 for a Ph.D. candidate, but this may vary based on the research project. Graduate tuition is waived for all students with research assistantships. A limited number of graduate fellowships are available. The information provided for the application to the Graduate School is also used to assign available assistantships to applicants. The Department of Plant Sciences also has numerous annual scholarships of \$500 to \$1000 each for outstanding Plant Sciences graduate students.

The M.S. program (Thesis Option) requires completion of at least 30 credits; this includes 10 credits of thesis research. The Ph.D. program requires completion of at least 90 credits; this includes 30 credits for an earned M.S. degree (Thesis Option) and 20 additional research credits. For each M.S. or Ph.D. candidate, a plan of study will be developed in the first year that meets the disciplinary requirements as well as the individual needs of the

student. The faculty adviser and other members of the student's supervisory/advisory and examining committee assist in developing of the plan of study as well as the student's research plan. An M.S. Program (Comprehensive Study Option) is also offered in Plant Sciences. This option requires completion of at least 30 credits, including 3 credits of a Master's Paper.

Candidates for the M.S. degree normally satisfy all requirements within a two-year period, and Ph.D. candidates normally require three additional years. For M.S. candidates, an oral examination of academics related to the discipline and the research-based thesis is required. The Ph.D. candidates are required to pass a preliminary written and oral examination of academics related to the discipline and a final oral defense of a research-based dissertation. A B.S. to Ph.D. program is permitted for students who meet higher admission requirements.

Marisol Berti, Ph.D.

North Dakota State University, 2007

Research Interests: Forage and Biomass Crop Production

Chris M. Boerboom, Ph.D.

University of Minnesota, 1989

Research Interests: Weed Science

Xiwen Cai, Ph.D.

Washington State University, 1998

Research Interests: Wheat Genetics

Marcelo J. Carena, Ph.D.

Iowa State University, 1999

Research Interests: Corn Breeding

Bingcan Chen, Ph.D.

University of Massachusetts, 2012

Research Interests: Cereal and Food Chemistry

Michael J. Christoffers, Ph.D.

University of Missouri-Columbia, 1998

Research Interests: Weed Science/Genetics

David Wenhao Dai, Ph.D.

North Dakota State University, 2001

Research Interests: Woody Plant Physiology, Biotechnology

Edward L. Deckard, Ph.D.

University of Illinois, 1970

Research Interests: Crop Physiology

Elias M. Elias, Ph.D.

North Dakota State University, 1987

Research Interests: Durum Wheat Breeding, Genetics

Kenneth F. Grafton, Ph.D.

University of Missouri, 1980

Research Interests: Dry Bean Breeding, Genetics

Greta Gramig, Ph.D.

University of Wisconsin-Madison

Research Interests: Weed Biology and Ecology

Andrew J. Green, Ph.D.

Kansas State University, 2016

Research Interests: Hard Red Spring Wheat, Genetics

Clifford A. Hall III, Ph.D.

University of Nebraska, Lincoln, 1996

Research Interests: Phytochemical Stability in Food Systems, Pulse Utilization and Quality, Flaxseed, Chemical Food Safety, Effect of Processing on Food Safety Issues

Harlene Hatterman-Valenti, Ph.D.

Iowa State University, 1993

Research Interests: High-Value Crop Production

Theodore C. Helms, Ph.D.

Iowa State University, 1986

Research Interests: Soybean Breeding, Genetics

Richard D. Horsley, Ph.D.

North Dakota State University, 1988

Research Interests: Barley Breeding, Genetics

Kirk A. Howatt, Ph.D.

Colorado State University, 1999

Research Interests: Weed Science, Annual Weeds

Burton L. Johnson, Ph.D.

North Dakota State University, 1993

Research Interests: Crop Production

Thomas J. Kalb, Ph.D.

Virginia Polytechnic Institute & State University, 1988

Research Interests: Extension Horticulture

Herman J. Kandel, Ph.D.

North Dakota State University, 1995

Research Interests: Crop Production

Chiwon W. Lee, Ph.D.

Purdue University, 1977

Research Interests: Vegetables, Floriculture, Biotechnology

Deying M. Li, Ph.D.

Iowa State University, 2001

Research Interests: Sports Turf Management

Xuehui Li, Ph.D.

University of Georgia, 2009

Research Interests: Statistical Genomics

Rodney G. Lym, Ph.D.

University of Wyoming, 1979

Research Interests: Weed Science Perennial Weeds

Frank A. Manthey, Ph.D.

North Dakota State University, 1985

Research Interests: Durum Wheat Quality, Pasta/Noodle Processing

G. Francois Marais, Ph.D.

North Dakota State University, 1979

University of Stellenbosch, 1992

Research Interests: Hard Red Winter Wheat Breeding, Genetics

Phillip E. McClean, Ph.D.

Colorado State University, 1982

Research Interests: Dry Bean Genetics, Biotechnology

Esther E. McGinnis

University of Minnesota, 2013

Research Interests: Extension Horticulture, Native Plants, Perennial Hardiness, Floriculture

Michael S. McMullen, Ph.D.

University of Minnesota, 1976

Research Interests: Oat Breeding, Genetics

Grant Mehring, Ph.D.

North Dakota State University, 2016

Research Interests: On-farm Research Agronomist

Rebekah Oliver, Ph.D.

North Dakota State University, 2006

Research Interests: Genetics

Juan Osorno, Ph.D.

North Dakota State University, 2006

Research Interests: Dry Edible Bean Breeding

Thomas Peters, Ph.D.

North Dakota State University, 1990

Research Interests: Sugarbeet Agronomy, Weed Science

Mukhlesur Rahman, Ph.D.

University of Manitoba, 2007

Research Interests: Canola Breeding

Joel K. Ransom, Ph.D.

University of Minnesota, 1982

Research Interests: Small Grains

Jijia Rao, Ph.D.

University of Massachusetts, 2013

Research Interests: Food Chemistry, Ingredient Technology

Andy Robinson, Ph.D.

Purdue University, 2012

Research Interests: Potato Production

Paul B. Schwarz, Ph.D.

North Dakota State University, 1987

Research Interests: Malting Barley Quality

Kalidas Shetty, Ph.D.

University of Idaho, 1989

Research Interests: Food Safety

Senay Simsek, Ph.D.

Purdue University, 2006

Research Interests: Hard Spring Wheat Quality

Asunta L. Thompson, Ph.D.

University of Idaho, 1998

Research Interests: Potato Breeding

Anuradha Vegi, Ph.D.

North Dakota State University, 2008

Research Interests: Teaching Techniques

Todd West, Ph.D.

Southern Illinois University, 2004

Research Interests: Woody Plant Improvement

Qi Zhang, Ph.D.

Kansas State University, 2007

Research Interests: Turfgrass Stress Physiology

Richard K. Zollinger, Ph.D.

Michigan State University, 1989

Research Interests: Weed Science/Applied Weed Control

Alan J. Zuk, Ph.D.

Kansas State University, 2005

Research Interests: Sports and Urban Turfgrass Management

Adjunct and Affiliate

James V. Anderson, Ph.D.

Virginia Polytech Institute, 1990
Research Interests: Plant Biochemistry

James Beaver, Ph.D.
University of Illinois, 1980
Research Interests: Dry Bean Genetics

Patrick M. Carr, Ph.D.
Montana State University, 1989
Research Interests: Sustainable Agriculture

Shiaoman Shaw Chao, Ph.D.
North Carolina State University, 1984
Research Interests: Small Grains Genomics

Wun Shaw Chao, Ph.D.
University of California-Davis, 1996
Research Interests: Perennial Weeds

Linda Dykes, Ph.D.
Texas A&M University, 2008
Research Interests: Food Science and Technology

Justin D. Faris, Ph.D.
Kansas State University, 1999
Research Interests: Wheat Molecular Genetics

Michael E. Foley, Ph.D.
University of Illinois, 1982
Research Interests: Weed Biology

Karen L. Fugate, Ph.D.
Ohio State University, 1995
Research Interests: Sugarbeet Physiology

Russell Gesch, Ph.D.
Texas A&M University, 1995
Research Interests: Physiology of Oilseed Crops

Darrin Haagenson, Ph.D.
Purdue University, 2001
Research Interests: Crop Physiology and Ecology

David P. Horvath, Ph.D.
Michigan State University, 1993
Research Interests: Perennial Weed Physiology

Brent Hulke, Ph.D.
University of Minnesota, 2007
Research Interests: Flax and Sunflower Genetics

Brian Jenks, Ph.D.
University of Nebraska, Lincoln, 1996
Research Interests: Integrated Weed Management

Blaine Johnson, Ph.D.
University of Nebraska, 1986
Research Interests: Quantitative Genetics

Edward C. Lulai, Ph.D.
North Dakota State University, 1978
Research Interests: Potato Physiology

Mohamed Mergoum, Ph.D.
Colorado State University, 1991

Research Interests: Hard Red Spring Wheat Breeding

Jae-Bom Ohm, Ph.D.

Kansas State University, 1996

Research Interests: Grain Science

Michael Ostlie, Ph.D.

Colorado State University, 2012

Research Interests: Weed Science

Timothy Porch, Ph.D.

Cornell University, 2012

Research Interests: Dry Bean Breeding and Genetics

Lili Qi, Ph.D.

Nanjing Agricultural University, 1997

Research Interests: Wheat Genetics

Susan Raatz, Ph.D.

University of Minnesota, 1996

Research Interests: Human and Clinical Nutrition

Gerald J. Seiler, Ph.D.

North Dakota State University, 1980

Research Interests: Sunflower and Sugarbeet Germplasm

Jochum Wiersma, Ph.D.

University of Minnesota, 1995

Research Interests: Small Grains

Steven S. Xu, Ph.D.

North Dakota State University, 1994

Research Interests: Hard Red Spring Wheat Development