KANSAS STATE UNIVERSITY

# Department of Agronomy
# Graduate Program Information

## OPPORTUNITIES FOR RESEARCH AND STUDY

The Department of Agronomy offers graduate study across six broad areas: Crop Physiology, Ecology and Production; Plant Breeding and Genetics; Precision Agriculture; Weed Science; Range and Forage Science; and Soil and Environmental Science. With approximately 40 graduate faculty and 80 graduate students, the program provides individualized training and substantial flexibility. Students work closely with major professors and supervisory committees, combining coursework, individualized study, and original research leading to theses or dissertations and scientific publications.

## AREAS OF EXPERTISE

**Crop Physiology, Ecology and Production** research focuses on crop responses to management and environmental conditions, including crop and forage production systems, plant-water relations, stress physiology, crop ecophysiology, genotype × environment × management interactions, and systems modeling to improve productivity, profitability, and resilience.

**Plant Breeding and Genetics** research focuses on crop improvement through conventional breeding, quantitative genetics, genomics, biotechnology, high-throughput phenotyping, and predictive approaches, with emphasis on yield, quality, adaptation, stress tolerance, disease and pest resistance, and germplasm enhancement.

**Precision Agriculture** research focuses on using data and technology to understand and manage variability in agricultural systems, including crop and soil sensing, remote sensing, precision water and nutrient management, variable-rate technologies, yield and stress monitoring, and data-driven decision-support tools.

**Range and Forage Science** research focuses on the productivity and sustainability of rangeland, pasture, forage, and livestock systems, including grazing management, forage utilization and quality, prescribed burning, weed and brush control, crop-livestock systems, nutrient and carbon dynamics, and plant–animal interactions.

**Soil and Environmental Science** research focuses on productive and sustainable soil and agricultural systems, including soil fertility and nutrient management, soil chemistry, physics and microbiology, soil-water processes, soil-root interactions, climatology and micrometeorology, conservation, and protection of soil, water, air, and natural resources.

**Weed Science** research focuses on weed ecology and integrated weed management, including weed population dynamics, crop–weed competition, herbicide efficacy and fate, herbicide resistance, and strategies for effective weed control.

## RESEARCH FACILITIES AND RESOURCES

Graduate students have access to laboratories, greenhouses, controlled-environment facilities, dryland and irrigated research fields, and field and plot research equipment. Research locations include Agronomy Farms near campus, Experiment Fields and Agricultural Research Centers across Kansas, providing diverse soils, climates, and production environments. Specialized resources include facilities for native range and grazing research as well as molecular genetics, genomics, remote sensing, soil, crop, and environmental research.

Additional resources include the Kansas Wheat Innovation Center, USDA research and genotyping facilities, K-State genomics facilities, the Agronomy Soil Testing Laboratory, Kansas State Water Quality Laboratory, and university computing and library resources.

## PROGRAM REQUIREMENTS AND FINANCIAL SUPPORT

Students typically enter with a B.S. or M.S. in agriculture, agronomy, crop or soil science, or a related life science. Preparation in biological, physical, and mathematical sciences is important. Each student's course requirements are established by a supervisory committee based on prior preparation, research needs, and professional goals.

Most Agronomy graduate students are supported by graduate research assistantships. Current half-time assistantships provide $25,781 per year for M.S. students and $28,842 per year for Ph.D. students, including paid tuition. Assistantship decisions are made by individual faculty advisors, so prospective students are encouraged to directly contact faculty members about research opportunities and funding. Graduate scholarships provide additional support to current students.

## APPLICATION PROCEDURES

Applications are accepted at any time. U.S. citizens and permanent residents are encouraged to apply 3 to 4 months prior to the semester for which they are seeking admission. International application deadlines are February 1 for fall, September 1 for spring, and December 1 for summer; applicants seeking assistantship consideration should apply one to two months earlier.

# AGRONOMY GRADUATE FACULTY LISTING

*Faculty are grouped by primary area of expertise, more information at https://www.agronomy.k-state.edu/about/people/faculty/*

## CROP PHYSIOLOGY, ECOLOGY AND PRODUCTION

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| **Eric Adee**, Ph.D., Univ. of Wisconsin<br>*Crop production/crop protection* | **Rachel L. Veenstra Cott**, Ph.D., Kansas State Univ.<br>*Crop production/crop ecology* |
| **Lucas Haag**, Ph.D., Kansas State Univ.<br>*Crop production* | **John Holman**, Ph.D., Univ. of Idaho<br>*Agricultural production systems* |
| **Mary Beth Kirkham**, Ph.D., Univ. of Wisconsin<br>*Plant physiology* | **Romulo P. Lollato**, Ph.D., Oklahoma State Univ.<br>*Crop production* |
| **Pramod Pokhrel**, Ph.D., Texas A&M Univ.<br>*Crop production* | **P.V. Vara Prasad**, Ph.D., Univ. of Reading<br>*Crop ecophysiology* |
| **Logan M. Simon**, Ph.D., Kansas State Univ.<br>*Crop production/cropping systems* | **Stephen M. Welch**, Ph.D., Michigan State Univ.<br>*Systems modeling* |
| **Sophie Westbrook**, Ph.D., Cornell Univ.<br>*Cropping systems and agroecology* | |

## PLANT BREEDING AND GENETICS

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| **Shannon Baker**, Ph.D., Texas A&M Univ.<br>*Wheat breeding and genetics* | **Terry Felderhoff**, Ph.D., Univ. of Florida<br>*Sorghum molecular genetics and breeding* |
| **Mary Guttieri**, Ph.D., Univ. of Nebraska<br>*Wheat breeding and genetics* | **Katherine Jordan**, Ph.D., North Carolina State Univ.<br>*Wheat genomics and breeding* |
| **Aaron Kusmec**, Ph.D., Iowa State Univ.<br>*Crop quantitative genetics* | **Sandeep Marla**, Ph.D., Purdue Univ.<br>*Sorghum genetics* |
| **Ramasamy Perumal**, Ph.D., Tamil Nadu Agricultural Univ.<br>*Sorghum breeding and genetics* | **Michael Stamm**, M.S., Kansas State Univ.<br>*Canola breeding* |
| **Liza Van der Laan**, Ph.D., Iowa State Univ.<br>*Soybean breeding and genetics* | **Guorong Zhang**, Ph.D., North Dakota State Univ.<br>*Wheat breeding and genetics* |

## PRECISION AGRICULTURE

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| **Gaurav Jha**, Ph.D., New Mexico State Univ.<br>*Precision agriculture, remote sensing* | **Deepak Joshi**, Ph.D., South Dakota State Univ.<br>*Precision agriculture* |

## RANGE AND FORAGE SCIENCE

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| **Keith R. Harmoney**, Ph.D., Iowa State Univ.<br>*Range and forage management* | **Doo-Hong Min**, Ph.D., Univ. of Maryland<br>*Forage management and utilization* |
| **Molly Reichenborn**, Ph.D., New Mexico State Univ.<br>*Range management, ecology, and extension* | **Colin Tobin**, Ph.D., New Mexico State Univ.<br>*Range management, grazing ecology* |

## SOIL AND ENVIRONMENTAL SCIENCE

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| **Ganga Hettiarachchi**, Ph.D., Kansas State Univ.<br>*Soil and environmental chemistry* | **Gerard Kluitenberg**, Ph.D., Iowa State Univ.<br>*Soil physics* |
| **Brett Lane**, Ph.D., Univ. of Florida<br>*Soil microbiology* | **Xiaomao Lin**, Ph.D., Univ. of Nebraska<br>*Agricultural climatology and bio-atmospheric interactions* |
| **Colby Moorberg**, Ph.D., North Carolina State Univ.<br>*Soil-root Interactions & hydropedology* | **Nathan O. Nelson**, Ph.D., North Carolina State Univ.<br>*Soil fertility, nutrient management, and water quality* |
| **Augustine Obour**, Ph.D., Univ. of Florida<br>*Soil and nutrient management* | **Andres Patrignani**, Ph.D., Oklahoma State Univ.<br>*Soil water processes* |
| **DeAnn Presley**, Ph.D., Kansas State Univ.<br>*Sustainable soil and water management* | **Cristie Preston**, Ph.D., Kansas State Univ.<br>*Soil fertility and nutrient management* |
| **Charles Rice**, Ph.D., Univ. of Kentucky<br>*Soil microbiology* | **Dorivar Ruiz Diaz**, Ph.D., Iowa State Univ.<br>*Soil fertility and nutrient management* |
| **Eduardo Santos**, Ph.D., Univ. of Guelph<br>*Agricultural micrometeorology* | **Peter Tomlinson**, Ph.D., Univ. of Arkansas<br>*Environmental quality and soil ecology* |

## WEED SCIENCE

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| **J. Anita Dille**, Ph.D., Univ. of Nebraska<br>*Weed ecology* | **Patrick Geier**, M.S., Kansas State Univ.<br>*Weed science* |
| **Jeremie K.B. Kouame**, Ph.D., Univ. of Arkansas<br>*Weed science* | **Sarah Ganske**, Ph.D., Texas A&M Univ.<br>*Integrated weed management* |