



The University of Texas Rio Grande Valley is looking for four graduate students to pursue master's level research focused on multiple dimensions of soil health management in the arid subtropics of deep south Texas, as part of a [multi-year evaluation of on-farm conservation innovation across water-limited farms](#). We are looking for highly qualified students interested in developing disciplinary expertise in the below areas of analysis, as well as interdisciplinary breadth through experiential training in [boundary spanning](#), interdisciplinary [systems analysis](#), participatory action research, and environmental leadership. In close collaboration with local area farmers, natural scientists, economists, and sustainable agriculture specialists across, students will help uncover and understand the ecological and socio-economic implications of conservation innovation in this unique region of the US. Currently, there are four main areas of interest where students can be involved:

**Ecohydrology & Plant Ecophysiology:** The graduate student will lead the soil moisture and plant moisture stress aspect of the project as their MS thesis, under the supervision of Brad Christoffersen. Student will work with a field technician to install and maintain a network of fully automated soil moisture sensors across 5 farms, and will lead the analysis of a continuous data stream of soil moisture data. Prior experience in processing and manipulating large datasets (preferably using R statistical software) is required. Additional training in 'big data' analytics will be offered. Data will be used to assess the impact of cover crops on plant available water and its seasonal and interannual variability. The student should also have an interest in developing research questions related to understanding plant physiological responses to moisture stress. The [Christoffersen lab](#) is equipped with instruments for measuring plant hydraulics and gas exchange (photosynthesis, transpiration, stomatal conductance). A good driving record and ability to drive university vehicles is required. Desired start date is summer 2021. Contact [bradley.christoffersen@utrgv.edu](mailto:bradley.christoffersen@utrgv.edu)

**Insect Biodiversity and Arthropod Community Dynamics:** The student(s) for this position will lead the insect ecology part of the grant as their MS Thesis, either through AESS (UTRGV SEEMS) or MS Biology program, under Rupesh Kariyat. The main objective of this part of the proposal is to identify, quantify and examine how arthropod diversity is influenced by on farm conservation innovation approaches such as cover cropping in RGV. The student will set up, collect and analyze insect data from traps from the farms. Following the field assessment, a chemical ecology-based approach (e.g., plant volatiles, olfactometry) to understand the ecological interactions mediated by these insect groups. Interested students are expected to have a background in at least two of these sub-disciplines- entomology/ecology/agronomy/plant biology. A working knowledge in statistics and having a driver's license is a plus. For details about the lab and research please visit <https://phenotype2017.wixsite.com/kariyatlab> and contact at [rupesh.kariyat@utrgv.edu](mailto:rupesh.kariyat@utrgv.edu).

**Soil health:** The student(s) for this part of the grant are expected to enroll as an MS student either through AESS M.S. (SEEMS) or Biology M.S. program, under Dr. Pushpa Soti. The main objective of this part of the proposal is to examine how cover cropping and

reduced tillage practices influence soil fertility and biology. The student will collect and analyze soils from various farms where cover crops will be planted to compare from similar soils where conventional tillage and process samples in the lab using a variety of laboratory equipment. Interested students are expected to have a background in environmental sciences, soil science, or a related field. A working knowledge in statistics, laboratory safety, and having a driver's license is a plus. For details about this position please contact Dr. Pushpa Soti @ [pushpa.soti@utrgv.edu](mailto:pushpa.soti@utrgv.edu) **(POSITION FILLED)**

**Systems research for agriculture:** This project is a case study of an intentional, multi-dimensional systems approach to agricultural research, divergent from a conventional, reductionist approach to research common in agricultural sciences. A student will help with help collect information on collaboration, decision-making, and organizational structure of this project, and develop ways to examine way how project team members collect, curate, and analyze complex data sets and how this shapes process and outcomes of systems science. Qualified students will have backgrounds and interest relevant to food systems studies, participatory action research, and food sovereignty, and must be able to communicate objectively and compassionately with all participants in this project, including farmers. Also, student will be expected to be peripherally involved in all aspects of this project, including in the implementation of the trials, so must be able work well with multiple stakeholders. Ability to drive to field sites across the region is required. Interested students will be in the [Agroecology and Resilient Food Systems lab](#). Please connect at [alexis.racelis@utrgv.edu](mailto:alexis.racelis@utrgv.edu)

For these positions we are looking for students qualified working in team settings across a combination of field and indoor work, and who can tolerate being outside in hot and humid subtropical climates. Students are **expected to start in Summer or Fall 2021**, once they successfully submit their application through the UTRGV Graduate School. Selected will receive full tuition support and a monthly living stipend for two years as they complete their Masters degree. Through related project funding, additional support is available for research supplies, professional development, and travel to relevant conferences. If you are interested in joining this exciting project, please send a short introduction, a brief statement detailing your interest in these opportunities, and a CV/resume to the faculty indicated in the announcement. Applications will be reviewed and filled on a rolling basis. For more information about the application to the graduate school at UTRGV, click [here](#).

*More about the region: The University of Texas Rio Grande Valley is in the middle of one of the fastest growing areas in the nation, the southern tip of Texas known as the Rio Grande Valley. Located along the US-Mexico Border, the region is a vibrant, bicultural and bilingual area, known for its unusual biological diversity and as a state epicenter for agricultural production. The region was recently recognized as a mecca for sustainable and organic agriculture by [Morris and Maggiani \(2016\)](#), and according to the [Census of Agriculture](#) has the highest concentration of Hispanic famers in the country. This subtropical region includes the vibrant cities of McAllen and Brownsville, recently ranked #3 and #4 among US cities for the best places to live for quality of life.*

