How Does Tillage and Crop Rotational Diversity Influence Soil Health and Crop Productivity?

Mentor: Steve Culman (Assistant Professor), School of Environment and Natural Resources, Ohio State University

Project Description. Ohio State University's Triplett-Van Doren trials are the world's longest running continuous no-till research plots. Replicated at two sites in Ohio, they seek to examine the long-term effects of different tillage and crop rotation practices on soil properties and corn, soybean and hay productivity. We are finishing up two years of intense sampling efforts at these sites and are looking for a motivated summer intern that can help with a major effort to synthesize what we've learned from a half century agronomic experimentation. We will be comparatively analyzing Ohio data with data from Michigan State University's (MSU) Kellogg Biological Station Long-Term Ecological Research (KBS LTER) program in SW Michigan. The student will work with the current team composed of a postdoc, two graduate students and a professor on this synthesis, in addition to KBS LTER staff and scientists.

In addition, this project provides a range of opportunities depending on the student's interests. Possible topics include: 1) coupling over 50 years of crop yield data with weather data patterns to look at yield trends and yield stability, 2) mining soil data to examine main drivers of productivity in these systems, 3) determining feedbacks of crops on soil health pools over the course of a growing season, and 4) developing outreach materials (factsheets, videos) that translate some main findings to farmers and the public.

Fellowship Description. The ideal candidate will have a general enthusiasm for agroecology field crop research and soil health. Interest in conveying research findings to a general audience is important. Interest and experience working with quantitative data in excel and in statistical software packages (e.g. R, SAS) is preferred. We will provide numerous opportunities for learning in the lab and field. A collaborative and team-oriented lab group of postdocs, grad students and technicians that will provide research support and feedback when necessary and expose the student to a diverse range of projects: http://soilfertility.osu.edu. The position will be for 11 weeks, from May 20 – August 3, 2019 and will be based at the Ohio Agricultural Research and Development Center in Wooster, Ohio. Student housing is available on a first come basis. The student will work on average 40 hours a week and receive a stipend of $8000 to cover housing, living expenses, travel to OSU, and up to $500 in research supplies. The stipend will be paid in two payments, June 15 and July 15, 2019. Travel for field research, presentations, or academic meetings off campus will be covered by the research mentor's lab.

The student will be responsible for 1) meeting all requirements of their mentor, 2) writing a blog post about their research for the KBS LTER website, 3) attending a professional development seminar at KBS on creating research posters, and 4) presenting a professional research poster at the KBS summer research symposium on Wednesday, July 31, 2019 at KBS.

Apply by sending your CV or resume and a 1-page statement of interest describing your interest in and qualifications for this opportunity to Dr. Steve Culman at culman.2@osu.edu. Apply by March 1, 2019 for full consideration.

This project is funded by the National Science Foundation's Kellogg Biological Station Long-term Ecological Research (KBS LTER) program. **Priority will be given to non-MSU students who may not have many research opportunities at their college or university and under-represented minority students. Please note, students must be a U.S. citizen to apply.**