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## Steven W. Culman

Associate Professor and State Specialist of Soil Fertility  
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### EDUCATION

<b>Ph.D., Agronomy</b> , Cornell University, Ithaca, NY	2008
<b>M.S., Soil Science</b> , Cornell University, Ithaca, NY	2005
Fulbright Scholar, USEF Nepal, 2004	
<b>B.A., Biology</b> , Thomas More College, Crestview Hills, KY	1999

### RESEARCH AND EXTENSION EMPHASIS

My research and extension programs focus on improving soil fertility and nutrient management through management practices that enrich nutrient cycling, active organic matter pools and soil health. As the state specialist in soil fertility, I conduct research with, educate and learn from a wide variety of growers on nutrient management and soil fertility issues.

### PROFESSIONAL EXPERIENCE

<b>Associate Professor of Soil Fertility</b> , The Ohio State University School of Environment and Natural Resources Appointment: 50% Extension, 35% Research, 15% Teaching	2020 - Present
<b>Assistant Professor of Soil Fertility</b> , The Ohio State University <b>Postdoctoral Researcher</b> Agricultural Sustainability Institute, University of California, Davis Kellogg Biological Station, Michigan State University	2013 - 2020
Department of Land, Air and Water Resources, University of California, Davis	2013
	2009 - 2012
	2008 - 2009
<b>Graduate Research Assistant</b> , Cornell University Department of Crop and Soil Sciences	2001 - 2008

### TEACHING

<b>Instructor</b> , The Ohio State University, <i>Soil Fertility</i>	2014 - Present
<b>Instructor</b> , The Ohio State University, <i>Introduction to R for Environmental Sciences</i>	2014 - Present
<b>Instructor</b> , Michigan State University, <i>Practical Analysis of Ecological Communities in R</i>	2010
<b>Teaching Assistant</b> , Cornell University, <i>Sustainable Agriculture, Forages</i>	2005 - 2006

### ACTIVE GRANTS (10)

- Jungers, J. **Culman, S.W.**, et al. 2020-2025. Developing and deploying a perennial grain crop enterprise to improve environmental quality and rural prosperity. USDA-NIFA, AFRI Sustainable Agriculture Systems. (\$10,000,000)
- Culman, S.W.**, Sprunger, C., Sulc, R.M., Haden, V.R., Junger, J., Ryan, M., Crews, T., DeHaan, L. 2019-2023. Organic Dual-Use Perennial Grain Crops: Pathways to Profitability and Soil Health, USDA Organic Agriculture Research and Extension Initiative. (\$1,776,905)
- Jackson-Smith, D. Chaivegato, M., **Culman, S.W.**, Lyon, S., Parker, A., Shah, A., Sprunger, S. 2020-2023. Comparing the Environmental Tradeoffs and Synergies of Alternative Modes of Integrating Livestock into Cash Grain Cropping Systems. USDA-NIFA, AFRI Foundational and Applied Science. (\$999,408)
- Culman, S.W.** and Bergefurd, B. 2018-2020. Assessing Soil Fertility and Soil Health in Midwest Hop Production. USDA North Central Sustainable Agriculture Research and Education Grant. (\$98,561)
- Culman, S.W.** 2017-2021. Using active organic matter tests to help predict crop nutrient needs. New Innovator Award. Foundation for Food and Agriculture Research. (\$443,082)

- Culman, S.W.** 2020-2022. Documenting the impact of pipeline installation on crop productivity. 2016-2020. Kinder Morgan and Ohio Farm Bureau Federation. (\$120,000)
- A. Shah, F. Circle, K. Cornish, **S.W. Culman**, G. Kelderman, S. Khanal, S. Shearer, J. Witter. 2019-2022. Whole-plant based feedstock supply system for biobased industries. USDA-NIFA, AFRI Foundational and Applied Science. (\$1,000,000)
- Culman, S.W.** Demyan, M.S. 2020-201. Quantifying Soil Health in Ohio Soybean Fields. Ohio Soybean Council (\$26,000)
- Davies, G., Demyan, M.S., **Culman, S.W.**, Hattey, J. 2020-2024. Post-wildfire recovery and restoration of ecosystem productivity and soil health following wildfire in sagebrush rangelands. USDA-AFRI (\$499,590)
- Demyan, M.W. and **Culman, S.W.** 2020-2022. Better understand and measure dynamic soil properties (DSP) and develop optimized mid-infrared prediction techniques. USDA-NRCS (\$260,805)

### COMPLETED GRANTS (27)

- Culman, S.W.** Demyan, M.S. 2020-2021. Quantifying Soil Health in Ohio Soybean Fields. Ohio Soybean Council (\$65,000)
- Culman, S.W.** and Tilmon, K. 2019. Agronomic Crop Summer Internships. Ohio Soybean Council (\$40,000)
- Miller S.A., Testsen, A., **Culman, S.W.** Optimizing anaerobic soil disinfestation to manage emerging soilborne diseases in tomato protected culture systems in the North Central Region. USDA North Central Sustainable Agriculture Research and Education Grant. (\$149,349)
- Wilson, R., Doohan, D., Levies, K., **Culman, S.W.** Quantifying and predicting the effects of ecological weed management strategies on the organic agroecosystem to inform farmer decision making. 2015-2018. USDA Organic Transitions. (\$497,506)
- Culman, S.W.** 2018. Synthesis of Tri-State Recommendations. Ohio Soybean Council (\$10,000)
- Subburayalu, S., **Culman, S.W.**, Dick, W. Developing a tool for growers to predict sulfur availability in their soils. USDA AFRI-CARE 2015-2018. (\$199,771)
- Doohan, D., Dick, W., Kleinhenz, M., **Culman, S.W.**, Jackson-Smith, D., Kumarappan, S. 2014-2018. Practiced by Farmers but Untested by Scientists: Uniting Both in Participatory Research and Education to Explain the Effects of Soil Balancing on Farms, Soils, Crops, Weeds and Insects, USDA Organic Agriculture Research and Extension Initiative. (\$1,996,381)
- Hoy, C., Klaiber, H.A., Kumarappan, S., **Culman, S.**, Mariola, M., Moledina, A. 2014-2018. Diversification Strategy for Small and Medium-Sized Farms, USDA AFRI Small Medium Farms. (\$499,600)
- Scarf, P., Osmond, D., **Culman, S.**, LaBarge, G., Lory, J., Myers, B., Wattes, H. 2014-2017. Adaptive Management For Phosphorus To Improve Economic And Water Quality Outcomes, USDA AFRI. (\$473,021)
- Culman, S.W.**, Thomison, P., Lindsey, L., LaBarge, G., Waters, H., Lentz, E., Haden, V.R. 2015-2017. Revising Corn and Wheat Fertilizer Recommendations in Ohio. Ohio Corn Marketing Programs. (\$410,104)
- Culman, S.W.** 2017-2018. Soil Health and Potassium Fertilization for Quality and Yield. Mid-America Food Processors Association (\$18,204)
- Culman, S.W.** 2017-2018. **Response of long-term no-till and crop rotation on soil health.** Ohio No-Till Council (\$6,000)
- Culman, S.W.** and Lindsey, L. 2017. Revising Soybean Fertilizer Recommendations. Ohio Soybean Council. (\$120,000)
- Culman, S.W.**, Hurisso, T.T., Fulford, A.M. Chaganti, V.N. 2017. Evaluating Soil Protein as a New Soil Health Indicator. Organic Farming Research Foundation. (\$14,993)
- Culman, S.W.**, Lindsey, L., Dorrance, A. 2016. Revising Soybean Fertilizer Recommendations. Ohio Soybean Council. (\$180,000)
- Culman, S.W.** 2013 – 2016. Developing A Soil Active Organic Matter Test For Organic Growers. Ceres Trust Organic Research Initiative. (\$178,981)
- Culman, S.W.**, Doohan, D., Goebel, C., Dick, W., Haden, R. Witter, J. 2015. OARDC Equipment Grant. (\$15,485)

- Culman, S.W.**, Lindsey, L., LaBarge, G., Dorrance, A., Michel, A. 2014. Refining soil fertility recommendations for soybeans in Ohio. Ohio Soybean Council. (\$200,000)
- Culman, S.W.**, Slater, B. Dick, W., Dorrance, A., Michel, A., Haden, H. Sulc, M., Francis, D., Cornish, K., Basta, N. 2014. OARDC Equipment Grant. (\$26,149)
- Culman, S.W.**, Lindsey, L., LaBarge, G., Dorrance, A., Michel, A. 2013. Refining soil fertility recommendations for soybeans in Ohio. Ohio Soybean Council (\$192,248)
- Culman, S.W.** and Snapp, S.S. 2011 – 2012. A new crop for a variable climate: intermediate wheatgrass biology and forage potential. Generating Research and Extension to meet Economic and Environmental Needs, Michigan Forage Council (\$64,200)
- Snapp, S.S., **Culman, S.W.** and Morrone, V. 2010 – 2012. Fostering complex soil food webs and building soil fertility with organic production: the potential of perennial wheat. Ceres Trust Organic Research Grant (\$155,159)
- Culman, S.W.** Land Institute Graduate Research Fellow. 2005 – 2008. The Land Institute (\$22,500)
- Culman, S.W.**, Gaby, J.C., O'Neill, B.E., Cadillo-Quiroz, H. 2007. T-RF Manager: Software for the Analysis of Microbial Community Data. National Science Foundation, Biogeochemistry Integrative Graduate Education and Research Traineeship Program, Small Grant (\$4,500)
- Culman, S.W.** 2004 – 2005. Cornell University Conference Travel Grant (\$875)
- Culman, S.W.** 2003 – 2004. Fulbright Scholar, United States Educational Foundation, Nepal (\$18,500)
- Culman, S.W.** 2003. Cornell University, Foreign Language Area Studies Research Travel Grant (\$2,200)

## JOURNAL ARTICLES (62) \*\* denotes research that originated in the Culman lab

### In press

- Perry, K. I., Hoekstra, N. C., Culman, S. W., & Gardiner, M. M. (2021). Vacant lot soil degradation and mowing frequency shape communities of belowground invertebrates and urban spontaneous vegetation. *Urban Ecosystems*.
- Navarro, K.A., Wijeratne, S., **Culman, S.W.**, Benitez,S., & Dorrance, A.E. (2021) Comparison of the Species of *Phytophthora*, *Pythium* and *Phytopyhtium* Associated with Soybean Genotypes in High Disease Environments in Ohio. *Phytobiomes Journal*
- Navarro, K.A., Wijeratne, S., **Culman, S.W.**, Benitez,S., & Dorrance, A.E. (2021) The Effect of Incubation Temperature on the Species Composition of *Phytophthora*, *Phytopyhtium*, and *Pythium* Communities Associated with Soybean. *Phytobiomes Journal*
- \*\*Deiss, L., Sall, A., Demyan, M. S. & **Culman, S. W.** (2021). Does crop rotation affect soil organic matter stratification in tillage systems? *Soil and Tillage Research*
- Brock, C., Jackson-Smith, D., Kumarappan, S., **Culman, S.**, Doohan, D., & Herms, C. (2021). The prevalence and practice of soil balancing among organic corn farmers. *Renewable Agriculture and Food Systems*

### Published

- Bowles, T. M., Mooshammer, M., Socolar, Y., Calderón, F., Cavigelli, M. A., **Culman, S. W.**, Deen, W., Drury, C. F., Garcia y Garcia, A., Gaudin, A. C. M., Harkcom, W. S., Lehman, R. M., Osborne, S. L., Robertson, G. P., Salerno, J., Schmer, M. R., Strock, J., & Grandy, A. S. (2020). Long-Term Evidence Shows that Crop-Rotation Diversification Increases Agricultural Resilience to Adverse Growing Conditions in North America. *One Earth*, 2(3), 284–293. <https://doi.org/10.1016/j.oneear.2020.02.007>
- Brock, C., Jackson-Smith, D., **Culman, S.**, Doohan, D., & Herms, C. (2020). Soil balancing within organic farming: Negotiating meanings and boundaries in an alternative agricultural community of practice. *Agriculture and Human Values*. <https://doi.org/10.1007/s10460-020-10165-y>
- Culman, S. W.**, Mann, M., Sharma, S., Saeed, M. T., Fulford, A. M., Lindsey, L. E., Brooker, A., Dayton, E., Warden, R., & Joern, B. (2020). Calibration of Mehlich-3 with Bray P1 and ammonium acetate in the Tri-

- State region of Ohio, Indiana and Michigan. *Communications in Soil Science and Plant Analysis*, 51(1), 86–97. <https://doi.org/10.1080/00103624.2019.1695825>
- Dayton, E. A., Shrestha, R. K., Fulford, A. M., Love, K. R., **Culman, S. W.**, & Lindsey, L. E. (2020). Soil test phosphorus and phosphorus balance trends: A county-level analysis in Ohio. *Agronomy Journal*, 112(3), 1617–1624. <https://doi.org/10.1002/agj2.20146>
- \*\*Deiss, L., **Culman, S. W.**, & Demyan, M. S. (2020). Grinding and spectra replication often improves mid-DRIFTS predictions of soil properties. *Soil Science Society of America Journal*, saj2.20021. <https://doi.org/10.1002/saj2.20021>
- \*\*Deiss, L., Margenot, A. J., **Culman, S. W.**, & Demyan, M. S. (2020). Tuning support vector machines regression models improves prediction accuracy of soil properties in MIR spectroscopy. *Geoderma*, 365, 114227. <https://doi.org/10.1016/j.geoderma.2020.114227>
- \*\*Deiss, L., Margenot, A. J., **Culman, S. W.**, & Demyan, M. S. (2020). Optimizing acquisition parameters in diffuse reflectance infrared Fourier transform spectroscopy of soils. *Soil Science Society of America Journal*, saj2.20028. <https://doi.org/10.1002/saj2.20028>
- Dill, T. E., Harrison, S. K., **Culman, S. W.**, & Lindsey, A. J. (2020). Grain Yield Response of Corn (*Zea mays* L.) to Nitrogen Management Practices and Flooding. *Plants*, 9(3), 348. <https://doi.org/10.3390/plants9030348>
- Hunter, M. C., Sheaffer, C. C., **Culman, S. W.**, & Jungers, J. M. (2020). Effects of defoliation and row spacing on intermediate wheatgrass I: Grain production. *Agronomy Journal*, 112(3), 1748–1763. <https://doi.org/10.1002/agj2.20128>
- Hunter, M. C., Sheaffer, C. C., **Culman, S. W.**, Lazarus, W. F., & Jungers, J. M. (2020). Effects of defoliation and row spacing on intermediate wheatgrass II: Forage yield and economics. *Agronomy Journal*, 112(3), 1862–1880. <https://doi.org/10.1002/agj2.20124>
- \*\*Osterholz, W. R., **Culman, S. W.**, Herms, C., Joaquim de Oliveira, F., Robinson, A., & Doohan, D. (2020). Knowledge gaps in organic research: Understanding interactions of cover crops and tillage for weed control and soil health. *Organic Agriculture*. <https://doi.org/10.1007/s13165-020-00313-3>
- Swab, R. M., Lorenz, N., Lee, N. R., **Culman, S. W.**, & Dick, R. P. (2020). From the Ground Up: Prairies on Reclaimed Mine Land—Impacts on Soil and Vegetation. *Land*, 9(11), 455. <https://doi.org/10.3390/land9110455>
- \*\*Wade, Jordon, **Culman, S. W.**, Logan, J. A. R., Poffenbarger, H., Demyan, M. S., Grove, J. H., Mallarino, A. P., McGrath, J. M., Ruark, M., & West, J. R. (2020). Improved soil biological health increases corn grain yield in N fertilized systems across the Corn Belt. *Scientific Reports*, 10(1). <https://doi.org/10.1038/s41598-020-60987-3>
- Wade, Jordon, Maltais-Landry, G., Lucas, D. E., Bongiorno, G., Bowles, T. M., Calderón, F. J., **Culman, S. W.**, Daughtridge, R., Ernakovich, J. G., Fonte, S. J., Giang, D., Herman, B. L., Guan, L., Jastrow, J. D., Loh, B. H. H., Kelly, C., Mann, M. E., Matamala, R., Miernicki, E. A., ... Margenot, A. J. (2020). Assessing the sensitivity and repeatability of permanganate oxidizable carbon as a soil health metric: An interlab comparison across soils. *Geoderma*, 366, 114235. <https://doi.org/10.1016/j.geoderma.2020.114235>
- \*\*Zone, P. P., **Culman, S. W.**, Haden, V. R., Lindsey, L. E., Fulford, A. M., & Zhao, K. (2020). Do soil test levels and fertilization with phosphorus and potassium impact field crop tissue concentrations? *Agronomy Journal*, 112(4), 3024–3036. <https://doi.org/10.1002/agj2.20243>
- \*\*Chaganti, V. N., **Culman, S. W.**, Dick, W. A., & Kost, D. (2019). Effects of Gypsum Application Rate and Frequency on Corn Response to Nitrogen. *Agronomy Journal*, 111(3), 1109–1117. <https://doi.org/10.2134/agronj2018.10.0683>
- \*\*Pugliese, J. Y., **Culman, S. W.**, & Sprunger, C. D. (2019). Harvesting forage of the perennial grain crop kernza (*Thinopyrum intermedium*) increases root biomass and soil nitrogen cycling. *Plant and Soil*, 437(1–2), 241–254. <https://doi.org/10.1007/s11104-019-03974-6>
- Sprunger, C. D., **Culman, S. W.**, Palm, C. A., Thuita, M., & Vanlauwe, B. (2019). Long-term application of low C:N residues enhances maize yield and soil nutrient pools across Kenya. *Nutrient Cycling in Agroecosystems*, 114(3), 261–276. <https://doi.org/10.1007/s10705-019-10005-4>

- \*\*Sprunger, C. D., **Culman, S. W.**, Peralta, A. L., DuPont, S. T., Lennon, J. T., & Snapp, S. S. (2019). Perennial grain crop roots and nitrogen management shape soil food webs and soil carbon dynamics. *Soil Biology and Biochemistry*, 137, 107573. <https://doi.org/10.1016/j.soilbio.2019.107573>
- \*\*Wade, Jordon, **Culman, S. W.**, Sharma, S., Mann, M., Demyan, M. S., Mercer, K. L., & Basta, N. T. (2019). How Does Phosphorus Restriction Impact Soil Health Parameters in Midwestern Corn–Soybean Systems? *Agronomy Journal*, 111(4), 1682–1692. <https://doi.org/10.2134/agronj2018.11.0739>
- \*\*Fulford, A., & **Culman, S.** (2018). Over-Fertilization Does Not Build Soil Test Phosphorus and Potassium in Ohio. *Agronomy Journal*, 110(1), 56–65. <https://doi.org/10.2134/agronj2016.12.0701>
- \*\*Hurisso, T., **Culman, S.**, & Zhao, K. (2018). Repeatability and Spatiotemporal Variability of Emerging Soil Health Indicators Relative to Routine Soil Nutrient Tests. *Soil Science Society of America Journal*, 82(4), 939–948. <https://doi.org/10.2136/sssaj2018.03.0098>
- \*\*Hurisso, T., **Culman, S.**, Zone, P., & Sharma, S. (2018). Absolute values and precision of emerging soil health indicators as affected by soil sieve size. *Communications in Soil Science and Plant Analysis*, 49(15), 1934–1942. <https://doi.org/10.1080/00103624.2018.1492597>
- \*\*Hurisso, T., Moebius-Clune, D., **Culman, S.**, Moebius-Clune, B., Thies, J., Van Es, H., & M, H. (2018). Soil Protein as a Rapid Soil Health Indicator of Potentially Available Organic Nitrogen. *Agricultural & Environmental Letters*, 3(1), 1–5. <https://doi.org/10.2134/acl2018.02.0006>
- Ryan, M. R., Crews, T. E., **Culman, S. W.**, DeHaan, L. R., Hayes, R. C., Jungers, J. M., & Bakker, M. G. (2018). Managing for Multifunctionality in Perennial Grain Crops. *BioScience*, 68(4), 294–304. <https://doi.org/10.1093/biosci/biy014>
- Sprunger, C., **Culman, S.**, Robertson, G., & Snapp, S. (2018). Perennial grain on a Midwest Alfisol shows no sign of early soil carbon gain. *Renewable Agriculture and Food Systems*, 33(4), 360–372. <https://doi.org/10.1017/S1742170517000138>
- Testen, A., Mamiro, D., Nahson, J., Amuri, N., **Culman, S.**, & Miller, S. (2018). Farmer-Focused Tools to Improve Soil Health Monitoring on Smallholder Farms in the Morogoro Region of Tanzania. *Plant Health Progress*, 19, 56–63. <https://doi.org/10.1094/PHP-08-17-0044-RS>
- \*\*Wade, J., **Culman, S.**, Hurisso, T., Miller, R., Baker, L., & Horwath, W. (2018). Sources of Variability that Compromise Mineralizable Carbon as a Soil Health Indicator. *Soil Science Society of America Journal*, 82(1), 243–252. <https://doi.org/10.2136/sssaj2017.03.0105>
- Brooker, A., Lindsey, L., **Culman, S.**, Subburayalu, S., & Thomison, P. (2017). Low Soil Phosphorus and Potassium Limit Soybean Grain Yield in Ohio. *Crop, Forage & Turfgrass Management*, 3(1). <https://doi.org/10.2134/cftm2016.12.0081>
- Calderon, F., **Culman, S.**, Six, J., Franzluebbbers, A., Schipanski, M., Beniston, J., Grandy, A., & Kong, A. (2017). Quantification of Soil Permanganate Oxidizable C (POXC) Using Infrared Spectroscopy. *Soil Science Society of America Journal*, 81(2), 277–288. <https://doi.org/10.2136/sssaj2016.07.0216>
- \*\*Chaganti, V., & **Culman, S.** (2017). Historical Perspective of Soil Balancing Theory and Identifying Knowledge Gaps: A Review. *Crop, Forage & Turfgrass Management*, 3(1), 1–7. <https://doi.org/10.2134/cftm2016.10.0072>
- Obrycki, J., Basta, N., & **Culman, S.** (2017). Management Options for Contaminated Urban Soils to Reduce Public Exposure and Maintain Soil Health. *Journal of Environmental Quality*, 46(2), 420–430. <https://doi.org/10.2134/jeq2016.07.0275>
- Crews, T., Blesh, J., **Culman, S.**, Hayes, R., Jensen, E., Mack, M., Peoples, M., & Schipanski, M. (2016). Going where no grains have gone before: From early to mid-succession. *Agriculture, Ecosystems & Environment*, 223, 223–238. <https://doi.org/10.1016/j.agee.2016.03.012>
- DeHaan, L., Van Tassel, D., Anderson, J., Asselin, S., Barnes, R., Baute, G., Cattani, D., **Culman, S.**, Dorn, K., Hulke, B., Kantar, M., Larson, S., Marks, M., Miller, A., Poland, J., Ravetta, D., Rude, E., Ryan, M., Wyse, D., & Zhang, X. (2016). A Pipeline Strategy for Grain Crop Domestication. *Crop Science*, 56(0), 1–14. <https://doi.org/10.2135/cropsci2015.06.0356>



- \*\*Fulford, A., **Culman, S.**, Mullen, R., Dygert, C., Labarge, G., Lentz, E., & Watters, H. (2016). Corn and soybean response to phosphorus and potassium fertilization in ohio. *Better Crops With Plant Food*, 100(2), 7–9. <http://www.ipni.net/publication/bettercrops.nsf/issue/BC-2016-2>
- \*\*Hurisso, T. T., **Culman, S. W.**, Horwath, W. R., Wade, J., Cass, D., Beniston, J. W., Bowles, T. M., Grandy, A. S., Franzluebbers, A. J., Schipanski, M. E., Lucas, S. T., & Ugarte, C. M. (2016). Comparison of Permanganate-Oxidizable Carbon and Mineralizable Carbon for Assessment of Organic Matter Stabilization and Mineralization. *Soil Science Society of America Journal*, 80(5), 1352–1364. <https://doi.org/10.2136/sssaj2016.04.0106>
- Londo, A., LaBarge, G., Watters, H., **Culman, S.**, Rose, M., Hall, P., Arnold, G., Custer, S., Richer, E., Noggle, S., & Penrose, C. (2015). Water Quality and Nutrient Management Extension Programs in Ohio. *Journal of Contemporary Water Research & Education*, 156(1), 48–55. <https://doi.org/10.1111/j.1936-704X.2015.03203.x>
- Hankinson, M., Lindsey, L., & **Culman, S.** (2015). Effect of Planting Date and Starter Fertilizer on Soybean Grain Yield. *Crop, Forage & Turfgrass Management*, 1(1), 1–6. <https://doi.org/10.2134/cftm2015.0178>
- DuPont, S., Beniston, J., Glover, J., Hodson, A., **Culman, S.**, Lal, R., & Ferris, H. (2014). Root traits and soil properties in harvested perennial grassland, annual wheat, and never-tilled annual wheat. *Plant and Soil*, 381(1–2), 405–420. <https://doi.org/10.1007/s11104-014-2145-2>
- Maul, J., Buyer, J., Lehman, R., **Culman, S.**, Blackwood, C., Roberts, D. P., Zasada, I. A., & Teasdale, J. R. (2014). Microbial community structure and abundance in the rhizosphere and bulk soil of a tomato cropping system that includes cover crops. *Applied Soil Ecology*, 77, 42–50. <https://doi.org/10.1016/j.apsoil.2014.01.002>
- Culman, S. W.**, Snapp, S. S., Ollenburger, M., Basso, B., & DeHaan, L. R. (2013). Soil and water quality rapidly responds to the perennial grain kernza wheatgrass. *Agronomy Journal*, 105(3), 735–744. <https://doi.org/10.2134/agronj2012.0273>
- Culman, S.**, Snapp, S., Green, J., & Gentry, L. (2013). Short- and long-term labile soil carbon and nitrogen dynamics reflect management and predict corn agronomic performance. *Agronomy Journal*, 105, 493–502. <https://doi.org/10.2134/agronj2012.0382>
- Grandy, A., Salam, D., Wickings, K., McDaniel, M., **Culman, S.**, & Snapp, S. (2013). Soil respiration and litter decomposition responses to nitrogen fertilization rate in no-till corn systems. *Agriculture, Ecosystems & Environment*, 179, 35–40. <https://doi.org/10.1016/j.agee.2013.04.020>
- Briar, S., **Culman, S.**, Young-Mathews, A., Jackson, L., & Ferris, H. (2012). Nematode community responses to a moisture gradient and grazing along a restored riparian corridor. *European Journal of Soil Biology*, 50, 32–38. <https://doi.org/10.1016/j.ejsobi.2011.11.006>
- Culman, S.W.**, Snapp, S., Freeman, M., Schipanski, M., Beniston, J., Lal, R., Drinkwater, L., Franzluebbers, A., Glover, J., Grandy, A., Lee, J., Six, J., Maul, J., Mirksy, S., Spargo, J., & Wander, M. (2012). Permanganate oxidizable carbon reflects a processed soil fraction that is sensitive to management. *Soil Science Society of America Journal*, 76(2), 494–504. <https://doi.org/10.2136/sssaj2011.0286>
- Jack, A., Rangarajan, A., **Culman, S.**, Sooks-Nguan, T., & Thies, J. (2011). Choice of organic amendments in tomato transplants has lasting effects on bacterial rhizosphere communities and crop performance in the field. *Applied Soil Ecology*, 48(1), 94–101. <https://doi.org/10.1016/j.apsoil.2011.01.003>
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- Glover, J., Reganold, J., Bell, L., Borevitz, J., Brummer, E., Buckler, E., Cox, C., Cox, T., Crews, T., **Culman, S.**, DeHaan, L., Eriksson, D., Gill, B., Holland, J., Hu, F., Hulke, B., Ibrahim, A., Jackson, W., Jones, S., ... Xu, Y. (2010). Increased Food and Ecosystem Security via Perennial Grains. *Science*, 328(5986), 1638–1639. <https://doi.org/10.1126/science.1188761>
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## **BOOK CHAPTERS AND OTHER PUBLICATIONS (5)**

### In press

- Culman, S.W.** Hurisso, T.T. & Wade, J. (2020) Permanganate Oxidizable Carbon: An Indicator of Biologically-Active Soil Carbon. *In: D.L. Karlen, D.E. Stott, and M.M. Mikha (eds). Laboratory Methods for Soil Health Assessment, Soil Science Society of America (SSSA) & Wiley International, SSSA, Madison, WI.*
- Hurisso, T.T. & **Culman, S.W.** (2020) Is Autoclaved Citrate-Extractable (ACE) Protein a Viable Indicator of Soil Nitrogen Availability?. *In: D.L. Karlen, D.E. Stott, and M.M. Mikha (eds). Laboratory Methods for Soil Health Assessment, Soil Science Society of America (SSSA) & Wiley International, SSSA, Madison, WI.*

### Published

- Barker, D. J., & **Culman, S. W.** (2020). Fertilization and Nutrient Management. In *Forages* (pp. 473–496). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781119436669.ch26>
- Dick, W., & **Culman, S.W.** (2016). Biological and Biochemical Tests for Assessing Soil Fertility. In A. Chatterjee & D. Clay (Eds.), *Soil Fertility Management in Agroecosystems*. American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, Inc. <https://doi.org/10.2134/soilfertility.2014.0007>
- Culman, S.W.**, Haden, V.R., Maxwell, T., Waterhouse, H., Horwath, W. 2014. Greenhouse Gas Mitigation Opportunities in California Agriculture: Review of California Cropland Emissions and Mitigation Potential. NI GGMOCA R3. Durham, NC: Duke University

## **EXTENSION ACTIVITIES**

Provide state-wide leadership in soil fertility, nutrient management and soil health across Ohio.

## Highlights

### Updated Fertilizer Recommendations

- Led effort to comprehensively update field crop fertilizer recommendations in Tri-State Region
- Work included over 300 on-farm strip trials across the state (2014-2018)
- **Culman, S.W.**, Fulford, A., Camberato, J., Stienke, K. (2020). *Tri-state fertilizer recommendations for corn, soybeans, wheat, and alfalfa*. (Bulletin 974). Columbus, OH: The Ohio State University.

### Soil Health

- Helped lead Ohio State University Signature Program in Soil Health, outreach program focused on education on diversity of soil health issues
- Developed Soil Health Outreach Website: <https://soilhealth.osu.edu/>
- Lead Soil Health In-Service Workshops: Intensive 1-day workshops to train educators in soil health (7 workshop ran, 247 participants total)
- Provide national outreach leadership on soil health, have given over 8 invited talks on soil health in regional conferences for certified crop advisors and commercial soil test laboratory operators

### University Factsheets

**Culman, S.W.**, Mann, M., Sharma, S., Saeed, M., Fulford, A., Lindsey, L., Brooker, A., Dayton, L., Eugene, B., Warden, R., Steinke, K., Camberato, J., Joern, B. Converting between Mehlich-3, Bray P, and Ammonium Acetate Soil Test Values, ANR-75: <https://ohioline.osu.edu/factsheet/anr-75>

**Culman, S.W.**, Zone, P., Kim, N., Fulford, A., Lindsey, L., Thomison, P., Dorrance, A., Minyo, R., Richer, E., Lentz, E., Haden, R., Watters, H., LaBarge, G. Nutrients Removed with Harvested Corn, Soybean and Wheat Grain in Ohio, ANR-74: <https://ohioline.osu.edu/factsheet/anr-74>

**Culman, S.W.**, Mann, M., Brown, C. Calculating Cation Exchange Capacity, Base Saturation, and Calcium Saturation. ANR-81: <https://ohioline.osu.edu/factsheet/anr-81>

LaBarge, G., **Culman, S.**, Custer, S., King, K., Lewendowski, R., Richer, E. *Phosphorus Nutrient Management for Yield and Reduced P Loss at Edge of Field* AGF-509: <https://ohioline.osu.edu/factsheet/agf-509>

Sharma, S., **Culman, S.**, Fulford, A., Lindsey, L., Alt, D., Looker, G. *Corn, Soybean, and Alfalfa Yield Responses to Micronutrient Fertilization in Ohio*, AGF-519: <https://ohioline.osu.edu/factsheet/agf-519>

Lentz, E., LaBarge, G., Lindsey, A., **Culman, S.** *Statistics and Agricultural Research*, ANR-40: <https://ohioline.osu.edu/factsheet/anr-40>

**Culman, S.**, Saeed, M., Fulford, A. *Ohio Data that Shaped the Tri-State Fertilizer Recommendations*, AGF-518: <https://ohioline.osu.edu/factsheet/agf-518>

### Ohio Agronomy Guide, 15<sup>th</sup> edition

**Culman, S.**, Haden, R., Witter, J. 2017. *Chapter 2: Soil and Water Management*. Ohio Agronomy Guide, 15<sup>th</sup> edition, Ohio State University Extension, Bulletin 472

Lentz, E., **Culman, S.**, Haden, R. 2017. *Chapter 3: Soil Fertility*. Ohio Agronomy Guide, 15<sup>th</sup> edition, Ohio State University Extension, Bulletin 472

Thomison, P., Michel, A., Tilmon, K., **Culman, S.**, Paul, P. 2017. *Chapter 4: Corn Production*. Ohio Agronomy Guide, 15<sup>th</sup> edition, Ohio State University Extension, Bulletin 472

Lindsey, L., Lentz, E., Michel, A., Tilmon, K., **Culman, S.** Paul, P. 2017. *Chapter 5: Small Grain Production*. Ohio Agronomy Guide, 15<sup>th</sup> edition, Ohio State University Extension, Bulletin 472

### Other Extension Publications

Lindsey L., Shrestha, R., McGlinch, G., **Culman, S.**, Loux, M., Paul, P., & Stockinger, E. (2020) *Management of Ohio Winter Malting Barley*. Columbus, OH: The Ohio State University.



Extension and Outreach Talks

2020: 18 presentations, ~1215 participants  
 2019: 26 presentations, ~1715 participants  
 2018: 17 presentations, ~1211 participants  
 2017: 14 presentations, ~480 participants  
 2016: 16 presentations, ~750 participants  
 2015: 18 presentations, ~870 participants  
 2014: 6 presentations, ~398 participants

CORN Newsletter Articles (>4K active subscribers)

2020 Articles: 3 as primary author, 4 as coauthor (7 total)  
 2019 Articles: 4 as primary author, 2 as coauthor (6 total)  
 2018 Articles: 6 as primary author, 5 as coauthor (11 total)  
 2017 Articles: 5 as primary author, 1 as coauthor (6 total)  
 2016 Articles: 4 as primary author, 4 as coauthor (8 total)  
 2015 Articles: 6 as primary author, 7 as coauthor (13 total)  
 2014 Articles: 1 as primary author, 3 as coauthor (4 total)

Miscellaneous Extension Service

- Started and lead Agronomic Crop Research and Extension (ACRE), a summer internship experience where undergraduate students are placed in county extension offices across the state to help facilitate on-farm research
- Ohio NCRS 590 Advisory Committee (2020)
- Curricula Development for the Fertilizer Application Certification Training program which certifies >12k commercial applicators every 3 years
- Provide annual editorial review of extension ANR on-farm research reports in soil fertility

**ADVISING AND MENTORSHIP**Postdoctoral Research Scholars (7 total)

**Current:** Leonardo Deiss

**Complete:** Anthony Fulford, Tunsisa Hurriso, Vijay Chaganti, Christine Sprunger, William Osterholz, Jordon Wade

Graduate Student Chair (8 total)

**Current:** Louceline Fleuridor (PhD, SENR), Theresa Brehm (MS, SENR)

**Complete:** Jordon Wade (PhD, SENR), Louceline Fleuridor (MS, HCS), Noely Gonzalez-Maldonado (MS, SENR), Phoo Zone (MS, ESGP), Jennie Pugliese (MS, SENR), Cassandra Loney (MENR)

Graduated Student Committee Member (28 total)

**Current MS students (4):** Prabu Singh (ESGP), Chris Shoup (FABE), Ashley Dyck (SENR), Shannon Pace (SENR)

**Completed MS students (13):** Matt Hankinson (HCS), Claire Sutton (SENR), Katie Linder (HCS), Aaron Brooker (HCS), Dave Tomaszewski (SENR), Meredith Eyre (Plant Pathology), Andrea Leiva Soto (HCS), Steven Doyle (SENR), Jonell Winger (MPHM), Trey Colley (FABE), Taylor Dill (HCS), Thomas Doohan (SENR), Tvisha Martin (SENR)

**Current PhD students (5):** Alyssa Lamb (HCS), Andrea Leiva Soto (HCS), Nall Moonilall (ESGP), Greg McGlinch (HCS), Emma Matcham (PhD @ University of Wisconsin)

**Completed PhD students (6):** John Obrycki (SENR), Anna Testen (Plant Pathology), Emma Kurth (SENR),

Ellen Maas (SENR), Luis Huezo (FABE), Ram Khadka (Plant Pathology)

#### Visiting Scholars Hosted

Muhammad Tariq Saeed

#### Post-Bachelor Technicians

Kenzie Reynen, Phoo Zone, Stuti Sharma, Meredith Mann, Bethany Herman, Nicole Hoekstra

#### Summer Undergraduate Research Internships (9 total)

Student Research Opportunities (SROP): Noely Gonzalez-Maldonado, Otto Oppenheimer

OARDC Research Internship Advisor: Nakian Kim, Samantha Wander, Faheem Ali, Aista Sall, Camila Gutierrez Manriquez

ATI Summer Internships: Andrew Herzog, Madison Gray

Undergraduate Advisor for Sustainable Agriculture Minor (2015-Present)

## **ACADEMIC SERVICE AND ACTIVITIES**

#### Manuscripts Reviewed for:

Agriculture, Ecosystems and Environment, Agricultural and Environmental Letters, Agronomy Journal, Applied Microbiology and Biotechnology, Applied Soil Ecology, Crop Management, FEMS Microbiology Letters, Field Crops Research, Geoderma, Journal of Environmental Quality, Microbial Ecology, Nature Food, Nature Methods, Renewable Agriculture and Food Systems, Plant and Soil, Plant Breeding, Soil Biology and Biochemistry, Soil Research, Soil Science Society of America Journal, The Journal of Agricultural Science

#### National and Regional Service:

Associate Editor for Soil Science Society of America Journal	2020-Present
External Grant Reviewer for Sustainable Agriculture Research and Education (NC-SARE)	2020
External Grant Reviewer for FFAR New Innovator Awards	2020
North Central Extension and Research Activity (NCERA-13) State Representative	2014–Present
Foundation for Food and Agricultural Research Soil Health Advisory Committee	2016–2018
Perennial Grain Community Chair and Vice-Chair, American Society of Agronomy	2015–2016
Mentor for Golden Opportunity Scholars Program, Agronomy Science Foundation	2012
External Grant Reviewer for USDA-ARS Project Plan: Water Quality Processes, Management and Control	2012

#### Miscellaneous Service:

Ohio State SENR Grad Studies Committee Soil Rep	2016–2020
Ohio State OARDC Consolidated Farms Committee	2016–Present
Ohio State SENR Greenhouse Representative	2015–Present
Ohio State SENR Faculty Search Co-Chair, Soil Rhizosphere Processes	2018
Ohio State SENR Faculty Search Committee, Community Food Systems	2017
Ohio State Mellinger Farm Advisory Committee	2015 – 2017
Ohio State SENR Faculty Search Committee, Soil and Environmental Mineralogy	2016
Ohio No-Till Council Board Member	2015–2016
International Perennial Grains Conference Organizer, Kellogg Biological Station	2010, 2011
Seminar Committee Member, Kellogg Biological Station	2010 – 2011
President of New World Agriculture and Ecology Group at Cornell	2004 – 2005

Cornell Departmental Graduate Student Symposium Organizer  
Permaculture Designer Certificate, NSW Australia

2003  
1999

Professional Affiliations

American Society of Agronomy, Soil Science Society of America