

## **PUBLICATIONS**

EXPERIMENT STATION: Connecticut

### **Dissertations, Theses (Published)**

1. Ankit Kumar Singh, 2022. GREENBOX Technology for Urban Crop Production: Technical Performance and Financial Feasibility. PhD dissertation, University of Connecticut, Storrs, CT

### **Non-Refereed Conference Publications (Published)**

1. Singh, A.K. and X. Yang, 2022. Financial feasibility of GREENBOX technology for urban crop production. ASABE Paper No. 2201068. ASABE, St. Joseph, MI

### **Refereed Journal Articles (Published)**

1. Singh, A.K. and X. Yang, 2021. GREENBOX horticulture, an alternative avenue of urban food production. *Agricultural Sciences* 12: 1473-1489

EXPERIMENT STATION: Illinois

### **Books (Published)**

- Ciolkosz (Ed.): *Regional Perspectives on Farm Energy*, Springer Nature. Switzerland AG. ISBN 978-3-030-90830-0.

### **Book Chapters (Published)**

- Johnstonbaugh E. and Wang X. 2022. Energy Efficiency – Smart Metering. In: Ciolkosz (Ed.): *Regional Perspectives on Farm Energy*, Springer Nature. Switzerland AG. ISBN 978-3-030-90830-0. pp.15-18.

### **Refereed Journal Articles (Published)**

- Z. Zhao, Y. Lin, A. Stumpf, X. Wang, Assessing impacts of groundwater on geothermal heat exchangers: A review of methodology and modeling, *Renew. Energy* 190 (2022) 121147. <https://doi.org/10.1016/j.renene.2022.03.089>.

EXPERIMENT STATION: New Jersey

### **Book Chapters (Published):**

- Both, A.J. 2022. Greenhouse energy efficiency and management, Chapter 11. In *Regional Perspectives on Farm Energy* (D. Ciolkosz, Ed.). Springer, Switzerland. pp. 85-93.
- Both, A.J. 2022. On-farm energy production – Solar, wind, geothermal, Chapter 12. In *Regional Perspectives on Farm Energy* (D. Ciolkosz, Ed.). Springer, Switzerland. pp. 95-105.

### **Refereed Journal Articles (Published):**

- Lewus, D.C. and A.J. Both. 2022. Using computational fluid dynamics to evaluate high tunnel roof vent designs. *AgriEngineering* 4(3), 719-734; <https://doi.org/10.3390/agriengineering4030046>
- Lubna, F.A., D.C. Lewus, T.J. Shelford, and A.J. Both. 2022. What you may not realize about vertical farming. *Horticulturae* 8(4), 322. <https://doi.org/10.3390/horticulturae8040322>
- Shelford, T.J. and A.J. Both. 2021. On the technical performance characteristics of horticultural lamps. *AgriEngineering* 3:716-727. <https://doi.org/10.3390/agriengineering3040046>

### **Abstracts of papers presented at professional meetings (Published):**

- Birnie, D., W.R. Rucker, and A.J. Both. 2022. Comparison of sunlight shadow patterns and photovoltaic energy yields for various agrivoltaic array designs. ASA, CSSA, SSSA International Annual Meeting, Baltimore, MD. <https://scisoc.confex.com/scisoc/2022am/meetingapp.cgi/Paper/144722>
- Lubna, F.A. and A.J. Both. 2022. Assessing the environmental impacts of supplemental lighting for crop production across the United States. ASHS Annual Conference, Chicago, IL. *HortScience* 57(9) Supplement (Part 1), S63. <https://journals.ashs.org/hortsci/view/journals/hortsci/57/9S/article-pS1.xml>
- Brumfield, R.G., S. Arumugam, A.J. Both, M. Flahive Di Nardo, R. Govindasamy, D. Greenwood, J. Heckman, N. Polanin, A.A. Rouff, A. Rowe, and R. VanVranken. 2021. A successful educational program for women producers, beginning farmers, and military veterans that helped address farm risks during the COVID-19 pandemic. Presented at the 2021 Annual Conference of the American Society for Horticultural Science (ASHS), Hybrid, Denver, CO, August 5-9. *HortScience* 56(9) Supplement, S61.

### **Refereed Symposium Proceedings Articles (Published):**

- Llewellyn, D., T.J. Shelford, Y. Zheng, and A.J. Both. 2022. Measuring and reporting lighting characteristics important for controlled environment plant production. *Acta Horticulturae* 1337:255-264.
- Shelford, T., A.J. Both, and N. Mattson. 2022. A greenhouse daily light integral control algorithm that takes advantage of day ahead market electricity pricing. *Acta Horticulturae* 1337:277-282.

### **Popular (Trade Journal) Articles (Published):**

- Both, A.J. 2022. A quick look into LEDs. *GrowerTalks*. April Issue. pp. 50-51.

### **Other Creative Works:**

- Both, A.J. and N. Mattson. 2022. What to expect when you're selecting? Light systems and economics. Presentation at Cultivate'22, Columbus, OH. July 19.
- Both, A.J. 2022. Review of greenhouse energy issues. Online presentation for the Greenhouse Grower School (Cornell Cooperative Extension of Orange County). February 9.

- Both, A.J. 2022. Hydroponics. Online presentation for students at the Sojourner Truth Middle School, East Orange, NJ. January 28.
- Both, A.J. 2022. Greenhouse design. Online presentation for the 5<sup>th</sup> Annual Urban Farmer Winter Meeting (University of Maryland Cooperative Extension). January 24.
- Both, A.J. 2021. Sustainable crop production. Online presentation for students at Delaware Valley University. December 7.
- Both, A.J. 2021. Energy conservation strategies for greenhouse crop production. Presentation at the Northeast Greenhouse Conference and Expo. Boxborough, MA. November 4.
- Both, A.J. 2021. Focusing on sustainability: Crop production, soils and energy (Agrivoltaics as a solution?). Presentation for Annie's Project New Jersey: 10 Years of Empowering New Jersey Farmers. New Brunswick, NJ. November 4.
- Both, A.J. 2021. Are LED lamps better for crop production in greenhouses? Narrated PowerPoint presentation for the Energy Answers for the Beginning Farmer and Rancher Project. Available at: <https://farm-energy.extension.org/energy-answers-for-the-beginning-farmer-and-rancher/>
- Both, A.J. 2021. How can we improve energy efficiency in greenhouses? Narrated PowerPoint presentation for the Energy Answers for the Beginning Farmer and Rancher Project. Available at: <https://farm-energy.extension.org/energy-answers-for-the-beginning-farmer-and-rancher/>
- Both, A.J. 2021. What alternative energy systems can be used in the greenhouse industry? Narrated PowerPoint presentation for the Energy Answers for the Beginning Farmer and Rancher Project. Available at: <https://farm-energy.extension.org/energy-answers-for-the-beginning-farmer-and-rancher/>
- Specca, D.R. 2021 Agrivoltaics/Dual Use Solar: A Win-Win for Ag Viability? Narrated PowerPoint presentation for the NJ Farm Bureau Delegates at their Annual Convention. November 15.
- Specca, D.R. 2022 Clean and Renewable Energy Options for NJ Homes and Businesses. Presentation to the NJAES Environmental Stewards Class. March 1.
- Specca, D.R. 2022 The Rutgers Agrivoltaics Program. Presentation to the Agriculture and Natural Resources Department, NJ Agricultural Experiment Station. March 25.

#### **Workshop Sponsor:**

- Both, A.J., D. Specca, D.P. Birnie, and K.P. Sullivan. 2022. Agrivoltaics. Information session at the 67<sup>th</sup> New Jersey Agricultural Convention and Trade Show. February 8-10.

#### **Workshop Participant:**

- Specca, D. and A.J. Both. 2022. National Extension Energy Summit combined with the National Sustainability Summit. Penn State University. May 15-18.

#### **Refereed Journal Articles (Pending):**

- Brumfield, R.G., M. Flahive Di Nardo, A.J. Both, J. Heckman, A. Rowe, R. VanVranken and M. Bravo. 20xx. Online workshop empowers women farmers to manage business risk during the pandemic. Accepted for publication in Acta Horticulturae.

EXPERIMENT STATION: Pennsylvania

### **Books (Published)**

- Ciolkosz, D. (ed.): Regional Perspectives on Farm Energy. Springer Nature Switzerland AG. ISBN 978-3-90830-0. pp. 1-14.

### **Book Chapters (Published)**

- Ciolkosz, D., and Go, A. 2022. Energy Use on the Farm. In: Ciolkosz (ed.): Regional Perspectives on Farm Energy. Springer Nature Switzerland AG. ISBN 978-3-90830-0. pp. 1-14.
- Ciolkosz, D., and Steiman, M. 2022. On-Farm Energy Production: Biofuels. In: Ciolkosz (ed.): Regional Perspectives on Farm Energy. Springer Nature Switzerland AG. ISBN 978-3-90830-0. pp. 139-148.

### **Refereed Journal Articles (Published)**

- Tripathi, J., Richard, T. L., Memis, B., Demirci, A., & Ciolkosz, D. (2022). Interactions of Torrefaction and Alkaline Pretreatment with Respect to Glucose Yield of Hydrolyzed Wheat Straw. *Biomass*, 2(4), 264-278.
- Chahal, A., Tripathi, J., Ciolkosz, D., Wurzbacher, S., and M. Jacobson. 2021. Perceptions of Debarking Small Stems in the Wood Products Community. *Forest Products Journal*. 71(4): 371-378. <https://doi.org/10.13073/FPJ-D-20-00074>
- Herbstritt, S., Fathel, S. L., Reinford, B., Richard, T. L. 2022. Waste to Worth: A Case Study of the Biogas Circular Economy in Pennsylvania. *Journal of ASABE*. doi: 10.13031/ja.14889.

### **Popular Articles (Published)**

- Ciolkosz, D. 2022. Anaerobic Digesters for Renewable Natural Gas. Penn State Renewable and Alternative Energy Fact Sheet Series. The Pennsylvania State University. University Park, PA.
- Miller, A. 2022. How to Choose a Solar Panel (Photovoltaics) Vendor. Penn State Extension Online Article. Published July 8, 2022
- Brockett, D. 2022. Pennsylvania Landowners Guide to Utility-Scale Solar Leasing. Penn State Extension Online Article. Published April 22, 2022
- Fathel, S. L. 2022. How Pennsylvania Biogas Can Participate in the Energy Marketplace. Penn State Extension Online Article. Published January 14, 2022.

### **Presentations (Papers)**

- Tripathi, J., and Ciolkosz, D. 2022. Techno-Economic Analysis of Wheat Straw-Based Ethanol System Consisting of Torrefaction and Alkaline Pretreatment Technologies.

Presented at ASABE International Meeting, July 19, 2012, Houston, TX.

- Tripathi, J., & Ciolkosz, D. 2022. Towards a Multiproduct BioRenewable Paper: Synergy of Torrefaction and Alkaline Pretreatment for Increased Utility. Presented at Penn State Biorenewables Symposium,, April 14, 2022, University Park, PA.
- Lopez-Olmedo, K., Ciolkosz, D., Frente-Carrasco, M., and Gomez-Hernandez, L. 2022. Wood Energy: An alternative for sustainable forest harvesting, Oaxaca, Mexico. Presented at Northeast Agricultural and Biological Engineering Conference. 310 Jul – 03 Aug 2022. Edgewood, MD.
- Asif, M., Farid, M., Ciolkosz, D., Ghafoor, A., Nasir, A., and Hussain, S. 2022. Development of Rotor Type Biomass Densification Machine for the Production of RDF Pellets from Agricultural Wastes and Crop By-Products. Presented at Northeast Agricultural and Biological Engineering Conference. 310 Jul – 03 Aug 2022. Edgewood, MD.
- Tripathi, J., Ciolkosz, D. 2022. Techno Economic Analysis of Wheat Straw Based Ethanol System Consisting of Torrefaction and Alkaline Pretreatment Technologies. Presented at Northeast Agricultural and Biological Engineering Conference. 310 Jul – 03 Aug 2022. Edgewood, MD.
- Fathel, S., Tripathi, J., & Ciolkosz, D. 2022 (Penn State University). Understanding the Role of Farm Energy in Extension Programs, National Extension Energy Summit + National Sustainability Summit 2022, Penn State University, University Park, PA.

### **Workshop Sponsor**

Biogas Systems Webinar Series (222 live attendees, recordings available online), April 11-15, 2022:

- (1) Understanding the Science of Biogas Production (<https://extension.psu.edu/biogas-systems-in-pennsylvania-understanding-the-science-of-biogas-production>)
- (2) Ways to Profit from Anaerobic Digestion (<https://extension.psu.edu/biogas-systems-in-pennsylvania-ways-to-profit-from-anaerobic-digestion>)
- (3) Carbon Markets for Biogas and Future Opportunities (<https://extension.psu.edu/biogas-systems-in-pennsylvania-carbon-markets-for-biogas-and-future-opportunities>)
- (4) Types of Anaerobic Digestion Systems: Community, Poultry, Small-Scale and More (<https://extension.psu.edu/biogas-systems-in-pennsylvania-types-of-anaerobic-digestion-systems-community-poultry-small-scale-and-more>)
- (5) Panel Discussion (<https://extension.psu.edu/biogas-systems-in-pennsylvania-panel-discussion>)

Other Webinars (recorded and available online at [extension.psu.edu](https://extension.psu.edu))

- Solar Law Symposium. November 16, 2022 (29 registrants)
- Open Solar Q&A for Series Participants. Aug 23, 2022 (283 registrants)
- Agrivoltaics and Solar Utility Considerations. Aug 9, 2022 (378 registrants)
- Estate Planning with Solar Leases. Jul 26, 2022 (219 registrants)

- Leasing Your Land for Solar Energy Development. Jul 12, 2022 (189 registrants)
- Solar Leasing Questions, Answers, and Wrap Up. Mar 23, 2022 (313 registrants)
- Evaluating Key Contract Terms When Leasing Your Land for Solar Energy Development. Mar 16, 2022 (286 registrants)
- Utility-Scale and Community Solar in New York and Pennsylvania. Feb 2, 2022 (444 registrants)

Webinars that were not recorded:

- A Conversation with Local Government Officials: Farmland Transitions to Grid-Scale Solar. January 18, 2022 (41 registrants)
- A Conversation with Local Government Officials: Utility-Scale Solar Toolkit. February 15, 2022 (58 registrants)
- A Conversation with Local Government Officials: Utility-Scale Solar Ordinances at the Local Government Level. March 15, 2022 (58 registrants)
- A Conversation with Local Government Officials: Issues at the Convergence of Agriculture and Utility-Scale Solar Energy. April 19, 2022 (34 registrants)
- A Conversation with Local Government Officials: Siting Considerations for Utility-Scale Solar in Pennsylvania Communities. May 17, 2022 (33 registrants)
- A Conversation with Local Government Officials: Utility-Scale Solar Toolkit. June 21, 2022 (31 registrants)
- Tools for Local Officials in Regulating Utility-Scale Solar Development. July 19, 2022 (17 registrants)
- A Conversation with Local Government Officials: Where We Are Now with Utility-Scale Solar in Our Communities. August 16, 2022 (29 registrants)
- Mapping Out Potential Solar Development and Decommissioning: Discussion Series for Local Officials. September 20, 2022 (23 registrants)
- A Conversation with Local Government Officials: Decommissioning Utility-Scale Solar – Concerns and Options. October 18, 2022 (17 registrants)

### **Refereed Journal Articles (Pending)**

- Tripathi, J., and Ciolkosz, D. 2022. Torrefied paper as a packaging material and subsequently as a bioethanol substrate: Synergy of torrefaction and alkaline pretreatment for increased utility. Resources, Conservation and Recycling. Submitted for Publication.
- Valentin, M., Bialowiec, A., Karayel, D., Jasinskas, A., Ciolkosz, D., and Lavarias, J., 2022. Investigation of the Performance of a Cylindrical Hopper and Metering Device of a Carrot Seeder. Scientific Reports. Accepted pending revisions.
- Tripathi, J., Causer, T., Ciolkosz, D., DeVallance, D., and Nunes, L. 2022. Torrefied Biomass in the Bioeconomy. Renewable and Sustainable Energy Reviews. Submitted for Publication.
- Memis, B., Ciolkosz, D., Richard, T., and M. Hall. 2022. Impact of Alkali Pretreatment and Torrefaction on Glucose Production From Wheat Straw. Journal of the ASABE.

Accepted for Publication.

EXPERIMENT STATION: Maryland

### Book Chapters (Published)

- Hassanein, A., **Lansing, S.**, 2022. Boosting anaerobic digestion with microbial electrochemical technologies. In *Advances in Bioenergy*, pg 67-98. Elsevier. <https://doi.org/10.1016/bs.aibe.2022.05.003>.
- Hassanein, A., **Lansing, S.**, Keller, E., 2022. On-farm energy production: Biogas. In Ciolkosz, D. (eds) *Regional Perspectives on Farm Energy*, pg 117-138. Springer, Cham. [https://doi.org/10.1007/978-3-030-90831-7\\_14](https://doi.org/10.1007/978-3-030-90831-7_14).
- Ferrer-Martí, I., **Lansing, S.**, Marti-Herrero, J. (Eds), 2022. *Biogas for Rural Areas*. Printed edition of the special issue published in *Energies*. ISBN 978-3-0365-3236-3. Available at: <https://www.mdpi.com/books/pdfdownload/book/5004>.

### Refereed Journal Articles (Published)

- Hassanein, A., Moss, A., Cloyd, N. Lansing, S<sup>\*</sup>, 2022. Evaluation and life cycle assessment of a poultry litter anaerobic digester with nutrient capture. *Bioresource Technology Reports* 19, 101186. <https://doi.org/10.1016/j.biteb.2022.101186>.
- Hassanein, A., Kumar, A.N., Lansing, S<sup>\*</sup>, 2021. Impact of electro-conductive nanoparticle additives on anaerobic digestion performance – A Review. *Bioresource Technology* 432, 126023. <https://doi.org/10.1016/j.biortech.2021.126023>.
- Holl, E., Steinbrenner, J., Merkle, W., Krumpel, J., Lansing, S., Baier, U., Oechsner, H., Lemmer, A<sup>\*</sup>, 2022. Two-state anaerobic digestion: State of technology and perspective roles in future energy systems. *Bioresource Technology* 360: 127633. <https://doi.org/10.1016/j.biotech.2022.127633>.
- Nachod, B., Keller, E., Hassanein, A., Lansing, S<sup>\*</sup>, 2021. Assessment of petroleum-based plastic and bioplastics degradation using anaerobic digestion. *Sustainability* 13(23): 13295. <https://doi.org/10.3390/su132313295>.
- Schiavone, D. F. (2022). Identifying Opportunities and Priorities for Energy Extension. *The Journal of Extension*, 60(3), 8.
- Schiavone, D. F., & Montross, M. D. (2021). Thermophysical Properties of Baled Switchgrass. *Applied Engineering in Agriculture*, 37(6): 1107-1114.

### Extension Publications (Published)

- **Schiavone, D.** (2022). *A Brief Guide to On-Farm Solar*. The University of Maryland Extension, FS-1187.
- **Schiavone, D.** (2021). *Solar Panels are an Increasingly Common Sight on Urban and Rural Properties across Maryland*. The University of Maryland Extension, EB-455.
- **Schiavone, D.** (2021). *Maryland's Energy Market: The State Consumes More Energy than it Produces*. The University of Maryland Extension, FS-1188.

- **Schiavone, D.** (2022). *Energy Used in Homes, Businesses, and Farms is Typically Supplied as Heat or Electricity*. The University of Maryland Extension, EBR-63.

### **Invited Presentations (without Proceedings)**

- Lansing, S., 2022. Bioenergy and bioprocessing technologies: Novel integrations in waste to energy applications. Taiwanese Council of Agriculture. College Park, Maryland. August 4, 2022.
- Lansing, S., 2022. Policies affecting anaerobic digestion implementation. Cecil County Land Trust Anaerobic Digestion Roundtable, with representatives from US Senate, MD legislators and MD Governor's office. Elkton, Maryland. October 7, 2022.
- Lansing, S., 2022. Co-Digestion on a Maryland Farm. Northeast Agricultural and Biological Engineering Conference (NABEC). Invited Presentation and Tour, Rising Sun Maryland. August 3, 2022.
- Lansing, S., 2022. Transforming food waste to energy through anaerobic digestion. Colorado Mesa University Environmental Science Seminar Series (virtual). April 25, 2022.
- Lansing, S., 2022. Quantifying Cattle Manure-AMR Perceptions and Treatment System Variabilities to Develop a Novel Communication Framework for Conveying AMR Science and Mitigation Opportunities. USDA NIFA – Antimicrobial Resistance (AMR) FY 2022 Project Director's Meeting (virtual). March 16, 2022.
- Lansing, S., 2022. Policy strategies to build resilience in Maryland's food system (moderator), AGNR Sustainable Food Systems Lecture Series (virtual). March 8, 2022.
- Lansing, S., 2022. Biogas and bioplastics: Valorizing food waste, algae, and manure. Institute of Marine and Environmental Technology (IMET) Seminar, University of Maryland Center for Environmental Science (virtual). February 2, 2022.
- Lansing, S., 2022. Returned Peace Corps Volunteer Experience. Discussion panel for students interested in Peace Corps. College Park, MD. February 1, 2022.
- Lansing, S., Hassanein, A., 2021. On-farm renewable energy through anaerobic digestion. Cecil County Land Trust Anaerobic Digestion Roundtable, with representatives from US Senate, MD legislators and MD Governor's office. Elkton, Maryland. October 28, 2021.
- Lansing, S., 2021. Bringing renewable energy access to rural communities: Challenges and opportunities (invited panelist). College of Agriculture and Natural Resources (virtual). October 15, 2021.

### **Presentations (without Proceedings)**

- Amradi, N.K., Hassanein, A., Lansing, S., 2022 Volatile Fatty Acids and Bioplastic Production from Food Waste using Dark Fermentation. Northeast Agricultural and Biological Engineering Conference (NABEC), Edgewood, Maryland, July 31- August 3, 2022.



- Lansing, S., Hassanein, A., Mahoney, K., Amradi, N.K., Loraine, G., 2022. Biogas generation from food waste and black water using hydrodynamic cavitation, anaerobic digestion, microbial electrolysis, and electrocoagulation integration. Northeast Agricultural and Biological Engineering Conference (NABEC), Edgewood, Maryland, July 31- August 3, 2022.
- Lansing, S., 2022. Increasing the viability of our food systems and the value of our food waste. Northeast Agricultural and Biological Engineering Conference (NABEC), Edgewood, Maryland, July 31- August 3, 2022.
- Delp, D., Hassanein, A., May, P., Lansing, S., 2022. Fertilizing lettuce with algae, manure, and food waste co-digestion effluent. Northeast Agricultural and Biological Engineering Conference (NABEC), Edgewood, Maryland, July 31- August 3, 2022.
- Chatterjee, U., Felton, G., Hassanein, A., Lansing, S., 2022. Characterizing Poultry Litter Derived Biochar with Nitrogen Rich Digestate Effluent as Soil Amendment. Northeast Agricultural and Biological Engineering Conference (NABEC), Edgewood, Maryland, July 31- August 3, 2022.
- Na, S., Armadi, N.K., Hassanein, A., Lansing, S., 2022. Methane potential of fermented food waste. Summer Opportunities in Agricultural Research and the Environment (SOARE) Closing Presentation. College Park, MD. July 29, 2022.
- Lansing, S., Hassanein, A., Mahoney, K., Amradi, N.K., Loraine, G., 2022. Biogas generation from food waste and black water using hydrodynamic cavitation, anaerobic digestion, microbial electrolysis, and electrocoagulation integration. American Society for Agricultural and Biological Engineering (ASABE) Conference. Houston, TX. July 17-20, 2022.
- Delp, D., Hassanein, A., May, P., Lansing, S., 2022. Co-digestion of manure and food waste with algae harvested from an algal flow way (AFW). American Society for Agricultural and Biological Engineering (ASABE) Conference. Houston, TX. July 17-20, 2022.
- Poindexter, C., Lansing, S. Yarberry, A., Rice, C., Georgakakos, C., Gooch, C., 2022. A Mass Balance Approach to Antibiotic Resistance Partitioning in Dairy Manure Through A Continuous High Temperature Rotary Drum Composting Bedding Recovery Unit. American Society for Agricultural and Biological Engineering (ASABE) Conference. Houston, TX. July 17-20, 2022.
- Poindexter, C., Yarberry, A., Rice, C., Lansing, S. 2022. Correlation of Antibiotic Resistance and Temperature During Anaerobic Digestion of Dairy Manure. American Ecological Engineering Society (AEES) Conference, Baltimore, Maryland. June 20-23, 2022.
- Mahoney, K., Hassanein, A., Lansing, S., Kumar, N., Loraine, G., 2022. Energy Production and Waste Treatment from Food Waste and Blackwater through Integrating Anaerobic Digestion, Hydrodynamic Cavitation, Microbial Electrolysis Cells, and Electrocoagulation. American Ecological Engineering Society (AEES) Conference, Baltimore, Maryland. June 20-23, 2022.

- Amradi, N.K., Hassanein, A., Lansing, S., 2022. Dark Fermentation for Volatile Fatty Acids to Produce Bioplastics from Food Waste. American Ecological Engineering Society (AEES) Conference, Baltimore, Maryland. June 20-23, 2022.
- Delp, D., Hassanein, A., May, P., Lansing, S., 2022. Co-digestion of manure and food waste with algae harvested from an algal turf scrubber. American Ecological Engineering Society (AEES) Conference, Baltimore, Maryland. June 20-23, 2022.
- Chatterjee, U., Felton, G., Hassanein, A., Lansing, S., 2022. Utilizing Poultry Litter Derived Biochar as Soil Amendment. American Ecological Engineering Society (AEES) Conference, Baltimore, Maryland. June 20-23, 2022.
- Poindexter, C., Yarberry, A., Rice, C., Lansing, S. 2022. Comparative Analysis of Mesophilic and Thermophilic Anaerobic Digestion on the Reduction of Antibiotic Resistance within Dairy Manure. American Society of Microbiology. Washington D.C. June 9-13, 2022.
- Lansing, S., Amradi, N.K., Hassanein, A., 2022. Valorizing food waste through dark fermentation to bioplastics production. Society for Industrial Microbiology and Biotechnology (SIMB) Conference. New Orleans, LA. May 1-4, 2022.
- Chatterjee, U., Felton, G., Hassanein, A., Lansing, S. Utilizing Poultry Litter Derived Biochar as Soil Amendment in Ornamental Plants. National MANRRS conference, Division 1 Graduate Oral Competition in Biological, Physical, and Life Sciences, March 23-26, 2022, Jacksonville, Florida, 1st Place Winner Graduate Student Presentations.
- Schiavone, D. F. 2022. Solar Energy Education and Training. Association of Natural Resource Extension Professionals. Kalamazoo, MI. June 1-3, 2022.
- Schiavone, D. F. 2022. On-Farm Solar Energy Opportunities and Training. National Extension Energy Summit & National Sustainability Summit. State University, PA. May 15-18, 2022.

### **Posters (without Proceedings)**

- Amradi, N.K., Hassanein, A., Lansing, S., 2022 Biological Conversion of Food Waste to Bioenergy and Bioplastics (poster). Postdoc Research Symposium, University of Maryland, September 23, 2022.
- Poindexter, C., Yarberry, A., Rice, C., Lansing, S. 2022. Two-step multi-residue antibiotic extraction method for comparison of antibiotics concentrations in manure as it moves through a manure treatment system (poster). American Society of Mass Spectrometry, Minneapolis, MN. June 6-9, 2022.
- Schiavone, D. F. 2022. Developing Energy Extension and Outreach Initiatives in Maryland. American Society of Agricultural and Biological Engineers. Extension Professionals. Houston, TX. July 17-20, 2022.
- Schiavone, D. F. 2022. On-Farm Solar Energy Opportunities and Training. Northeast Agricultural and Biological Engineering Conference. Edgewood, MD. August 1-3, 2022.

## Reports

- Loraine, G., **Lansing, S.**, Hassanein, A., 2021. Production of biogas for energy generation using hydrodynamic cavitation, anaerobic digestion, and microbial electrolysis cells. Final Report DOD: Army STTR Final Report. 51 pages.
- Maryland Food System Resiliency Council, 2021. Maryland Food System Resiliency Council Interim Report to the Maryland General Assembly. Available at: [https://mdem.maryland.gov/Documents/MFSR Council Interim Report MGA 11012021.pdf](https://mdem.maryland.gov/Documents/MFSR_Council_Interim_Report_MGA_11012021.pdf). 86 pages.

## Other Creative Works

- Anaerobic Digestion with Stephanie Lansing., 2022. Bioenergy Devco. Available at: <https://www.youtube.com/watch?v=aRItrVLsI30>.
- Tales of the Resistance, 2021 (podcast). Episode 4: Meet the Team – Stephanie Lansing. iAMR podcast series. Available at <https://lplc.org/episode-4-meet-the-team-stephanie-lansing/> Duration: 15 minutes.
- Accuweather Prime TV, 2021 (national TV show/video). Team of researchers studying how to turn trash into energy. Air date: November 21, 2021. Available at: <https://www.accuweather.com/en/videos/team-of-researchers-studying-how-to-turn-trash-into-energy/39Gf58k0>
- **Schiavone, D. F.** 2022. How to select and install a solar disconnect switch. *The University of Maryland Extension*, Educational Video. October 27, 2022; Duration: 12:01.
- **Schiavone, D. F.** 2022. How to size and select a solar inverter. *The University of Maryland Extension*, Educational Video. September 20, 2022; Duration: 15:50.
- **Schiavone, D. F.** 2022. How to wire a solar charge controller and battery bank. *The University of Maryland Extension*, Educational Video. August 15, 2022; Duration: 10:53.
- **Schiavone, D. F.** 2022. How to select and size a solar charge controller. *The University of Maryland Extension*, Educational Video. July 17, 2022; Duration: 14:12.
- **Schiavone, D. F.** 2022. How to design and size a solar battery system. *The University of Maryland Extension*, Educational Video. June 12, 2022; Duration: 15:42.
- **Schiavone, D. F.** 2022. How to wire different sizes of solar panels together. *The University of Maryland Extension*, Educational Video. May 4, 2022; Duration: 12:04.
- **Schiavone, D. F.** 2022. How and why to wire solar panel in parallel. *The University of Maryland Extension*, Educational Video. April 8, 2022; Duration: 13:17.
- **Schiavone, D. F.** 2022. How and why to wire solar panel in series. *The University of Maryland Extension*, Educational Video. March 7, 2022; Duration: 13:05.
- **Schiavone, D. F.** 2021. How to wire a solar combiner box or pass through box. *The University of Maryland Extension*, Educational Video. February 7, 2022; Duration: 13:56.
- **Schiavone, D. F.** 2021. How to wire a solar junction box and assemble PV cables. *The University of Maryland Extension*, Educational Video. January 6, 2022. Duration: 10:19.

- **Schiavone, D. F.** 2021. How to size wires and fuses for a solar electric system. The University of Maryland Extension, Educational Video. December 8, 2021; Duration: 10:46.
- **Schiavone, D. F.** 2021. How to estimate the size of your solar electric system. The University of Maryland Extension, Educational Video. November 1, 2021; Duration: 14:53.
- **Schiavone, D. F.** 2021. How to Perform a Site Assessment and Shading Analysis for Solar. The University of Maryland Extension, Educational Video. October 4, 2022; Duration: 14:16.

EXPERIMENT STATION: Virginia

### Presentations

- Bovay, J., Ignosh, J., Berryhill, A., Daniels, W., Fike, J., & Meyers, R. (2022). Development of Large-Scale Solar Projects in Virginia. In Virginia Cooperative Extension 2022 Professional Development Conference. Virtual.
- Ignosh, J., & Ogejo, J. (2022). Abating Particulate Matter Emissions from On-Farm Poultry Litter-Fueled Energy Systems. Waste-to-Worth Conference. Oregon, OH. Retrieved from <https://lpec.org/>
- Rogers, J. (NCSU), Strong, R. (UMass-Amherst), Breger, D. (UMass-Amherst), Ignosh, J. (2022). "Dual Use Solar Project Experiences from North Carolina and Massachusetts".
- Ignosh, J. (2022). "Solar-Powered Water Pumping Systems - Options for Tenant Farmers".
- Ignosh, J. (2022). "Introduction to Micro-hydro Electric Systems".
- Friedel, J., & Ignosh, J. (2022). Solar Land Use Considerations. Webinar.
- Ignosh, J., Havranek, T. R., & Taylor, T. R. (2022). Webinar: "An Introduction to Multicriteria Decision Analysis".
- Friedel, J., & Ignosh, J. (2022). Solar Land Lease Considerations. Webinar.
- Ignosh, J., Havranek, T. R., & Taylor, T. R. (2022). Multicriteria Decision Analysis (MCDA) as a potential stakeholder-engaged methodology in evaluating design alternatives, including opportunities for co-benefits (e.g., agrivoltaics), with utility-scale solar projects. Blacksburg, VA.
- Ignosh, J. (2022). "Extension Programing and Farm Energy Issues", Romanian-American Foundation Visit. Weyers Cave, VA.

### Other Creative Works

- Goerlich, D., Donovan, P., Herndon, B., & Ignosh, J. (2022). "Virginia Land and Energy Navigator "VaLEN" Initial Report on the Development of a Map for Prime Farmland HB894 Workgroup (Chapter 488, 2022)"
- Ignosh, J., & Booher, M. (2022). Solar Water Pumping for Livestock: Exploring Options for Tenant Farmers.
- Ignosh, J., Bovay, J., Daniels, W., Fike, J., Lane, R., Meyers, R., Munsell, J., Paulette, M., Pent, G., Prysby, M., Sample, D., Shortridge, J., Welbaum, G. (2022). "A Better Solar "Panel" from Virginia Tech", Poster Session. Poster session presented at the

meeting of Center for Advanced Innovation in Agriculture (CAIA) Big Event.  
Blacksburg, VA.