

Robert J. Meinen

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PERSONAL STATEMENT:

Broad, deep, and reputable experiences in farm-level and system-wide environmental stewardship, agricultural extension, farm management, college-level teaching, scientific research, and unique pairing of advanced degrees in Animal Science and Soil Science provide a one-of-a-kind foundation, which allows continued and simultaneous advancement of agriculture, environment, and individual growth.

EDUCATION:

The Pennsylvania State University

- PhD, Soil Science, 2023.
- MS, Animal Science, 2008.
- BS, Agricultural Systems Management and Technologies, 1993.
- These degrees are from the Departments of Agricultural and Biological Engineering, Animal Science, and Ecosystem Science and Management, yet I work in a 4th department – Plant Science.

PENN STATE EMPLOYMENT:

- Assistant Research Professor, Director of the Pennsylvania Nutrient Management Education Program, Department of Plant Science (2022 – present)
 - State Extension Specialist: Nutrient and Manure Management
- Senior Extension Associate, Department of Animal Science, University Park, PA (2000-2022).

Environmental Programming and Activities

Pennsylvania Act 38 Nutrient and Odor Management Education Program

- Director, Pennsylvania Nutrient Management Education Program (NMEP) (July 2023 - present).
- Associate Director, Pennsylvania NMEP (September 2022-June 2023)
- Coordinator of state Nutrient Management Plan Writer Certification Program.
- Development of certification and continuing education material.
- Administrator of [Pennsylvania Nutrient Management Program website](#).
- Supervision of university NMEP staff.
- Lead of quarterly NMEP state workgroup meetings.

Pennsylvania Act 49 Commercial Manure Hauler and Broker Certification Program

- Industry leading education and networking result in industry-wide cultural progression, substantial improvements in environmental impact and worker safety.
- Principal Investigator and administrator of funding grant, contract, and work plan between the Pennsylvania State Conservation Commission and the Pennsylvania State University.
- Lead coordinator, curricula developer, and educator of certification programs.
- Lead development and educator of program Continuing Education.
- Participant in regulation and policy development. Recently instrumental in development of policies involving Land Application of Waste Milk and Mortality Disposal during COVID-19 supply chain interruptions. Currently a member of a workgroup that is exploring revisions of program legislation, regulation, and policy.

- Editor of industry newsletter.

Pennsylvania Nutrient Management Advisory Board (NMAB)

- Member of state level board since April 2020.
- Subcommittee participant for development of PA Department of Environmental Protection's Manure Management Manual Manure, Act 49 Commercial Manure Hauler Certification Program, and Act 38 Odor Management Plans.

Pennsylvania Act 38 Odor Management Plans

- Principal Investigator and administrator of funding grant, contract, and work plan between the Pennsylvania State Conservation Commission and the Pennsylvania State University.
- Participant of both the Penn State Technical Workgroup and the Pennsylvania Interagency Odor Workgroup, which advise program and regulation development.
- Educator for Act 38 Odor Management Plan Writer Continuing Education Program.
- Participation in the development of the Pennsylvania Odor Site Index and Odor Best Management Practices reference material.

Biosolids & PFAS

- Member of PFAS Biosolids Data Gathering Team, a 2025 workgroup assembled to assist the Pennsylvania Department of Environmental Protection in understanding and policy advancement. Report submitted July 15, 2025.

Pennsylvania Food Processing Residual (FPR) Workgroup

- Multiagency workgroup formed October 2023 by state House of Representatives and Department of Environmental Protection to explore and recommend revisions to existing regulations and policy manual for transport, storage, and land application of FPR's. Changes are expected to occur at legislative level.

PA DEP Manure Management Manual

- Team participant for development of material and educational program for 2011 release of this Department of Environmental Protection manual that acts as mandatory guidance and planning tool for all farms that generate or utilize manure in Pennsylvania (over 60,000 farms impacted).
- Reviewer of revisions for June 2024 public release of updated manual.

Regulatory Guidance

- Member of Manure Treatment Technology (MTT) Modeling Group. Group members include multi-agency staff, state Executive Branch leaders, and university advisors. The group's objective is to advance MTT aspects within the Chesapeake Assessment Scenario Tool (CAST), including encouraging model changes that will enhance MTT adoption, and subsequent environmental benefits (2024).
- Participant in 2022-23 committees that provide guidance to regulation revisions: Act 38 Nutrient Management; Act 38 Odor Management; Act 38 Nutrient Management Certification; Act 38 Nutrient Balance Sheets; Act 38 Winter Application Matrix; Act 49 Commercial Manure Hauler and Broker Certification. The regulatory revision process is expected to take several years.

North American Manure Expo (NAME)

- Co-chair of 2022 NAME in Chambersburg, PA (July 2022).
- Co-chair of 2015 NAME in Chambersburg, PA; 2,000 participants from 26 states, Washington D.C. and 4 Canadian Provinces. Manure Expo combines manure handling exhibits, technology demonstrations, and educational sessions. The 2-day educational event providing 4 tour options, over 60 educational sessions and numerous technology demonstrations. Budget of \$173,000 funded by twelve sponsors and 88 exhibitors.
- Winner of 2016 PA Governor's Award for Environmental Excellence (for 2015 Expo).
- NAME Board of Directors since its 2014 inception, formerly Secretary and Treasurer, currently in host board position. NAME is a non-profit 501(c)(3) organization with the mission of continuous improvement and oversight of the annual event. The board consists of multi-state and province extension educators, show managers, and industry representatives.
- Chairman of 2010 Manure Expo in Pennsylvania Furnace, PA; 1,300 participants, 59 exhibitors and 30 speakers from 9 states and Washington DC.

- Member of Manure Expo Educational Steering Committee, Feasibility Study Committee, Web Development Team, and Grant Proposal Team.
- Presenter at seven Manure Expos (OH, PA, ON, MO, PA, OH, IN).

Penn State Extension Livestock Team, Dairy Team, Poultry Team, and Animal Systems Teams

- Provision of expertise support and programming to these Extension Teams that deliver support and education in a wide variety of subjects for all agricultural animal production systems.

Penn State Extension Water Team

- Formed in May 2017, this multi-disciplinary team provides watershed management programming in areas of Agricultural Water Resources, Green Stormwater Management, and Drinking Water and Source Water Protection.
- 2022 Extension Director's Award, EXCELLENCE - Programming Team Award.
- Contributor to Manure Management Planning for Youth Animal Projects Curriculum (winner of 2020 Governor's Award for Environmental Excellence).

Penn State Field & Forage Crops (aka Agronomy) Team

- Expertise and support member of this agronomic-based Extension Team where manure and fertilizer nutrient utilization that meets agronomic, economic, and environmental goals is paramount to the team mission success.

Chesapeake Bay Program Commercial Swine Characterization Project Team

- Work with swine industry partners to assemble manure inventory and weight characteristics for current and historic data input for Chesapeake Bay Phase 6 Model.

Chesapeake Bay Program Agriculture Workgroup Manure Injection and Incorporation Expert Panel

- Conduct literature review and recommend nutrient reduction values for Chesapeake Bay Phase 6 Watershed Model resulting from manure and application technologies.

Virginia Tech Manure Treatment Technologies Expert Panel

- Conduct literature review and recommend nutrient reduction values for Chesapeake Bay Phase 6 Watershed Model resulting from manure treatment technologies.

Chesapeake Bay Agriculture Work Group, Animal Waste Management Systems and Poultry Heavy Use Concrete Pads Expert Panel Establishment Group.

- Subgroup development of RFP and guidance material for new Expert Panel.

Waste to Worth Conference

- Member of overall, Planning, Programming, and Social committees (2013 Denver, 2015 Seattle, 2017 Raleigh, 2019 Minneapolis, 2022 Toledo, 2025 Boise, 2027 Raleigh).

Teaching Responsibilities:

ANSC/AGECO/SOILS 418: Nutrient Management in Agricultural Systems

- Co-Instructor of this cross-listed course (Agroecology, Animal Science, Soils) focusing on Nutrient Management Planning and environmental issues of production agriculture (2009-present).

ANSC 306: Swine Production and Management

- Previous co-instructor (2013, 2015, 2017) of this course that covers all aspects of the swine industry and its production.

ANSC 450 - Dairy Farm Management Systems; ANSC 429 - Advanced Beef Cattle Production; ANSC 311 – Poultry Production and Management; ANSC 308 – Sheep and Goat Production and Management; ANSC 150 - Scope and Diversity in Animal Science; AG 150S - First Year Agriculture Seminar

- Routine guest lecturer of these courses.

ANSC 100: Introduction to Animal Industries

- Developed environmental curricula for this online course offered through the Penn State World Campus.

Penn State Swine Short Course

- Authored several chapters of this online introductory swine course offered through Penn State Extension; act as a resource for course instructors.

Grants and Research:

- Principal Investigator and administrator of funding grant, contract, and work plan between the Pennsylvania State Conservation Commission and the Pennsylvania State University entitled Pennsylvania Nutrient Management Education Program (2023-present).
- Principal Investigator and administrator of funding grant, contract, and work plan between the Pennsylvania State Conservation Commission and the Pennsylvania State University entitled Delivery of Manure Hauler & Broker Certification, Odor Management Support, and Site Assessment Programs (2013-2023).
- Coordination and reporting for grants from the Pennsylvania Department of Agriculture and the Pennsylvania Department of Environmental Protection involving the Commercial Manure Hauler and Broker Certification and PEACCE programs (2000-2013).
- Project participant in the following grants and research initiatives:
 - Improving Soil Nutrient Management through Innovative Manure, Fertilizer, and Biochar Practices. December 2025 (proposal).
 - NSF-NSFC (National Science Foundation-National Natural Science Foundation of China) Joint Conference. Hangzhou Zhejiang, Zhejiang University, China. September 18, 2024.
 - International Workshop on Soil Health and Environment. Hangzhou Zhejiang, Zhejiang University, China. September 18, 2024.
 - *Emergency Grinding and Compost Training and Education for Regional Industry Stakeholders* (funding announced November 2020 by National Animal Disease Preparedness and Response Program of USDA APHIS) – Expertise and Outreach for emergency mass mortality disposal planning at livestock and poultry farms.
 - *Long-Term Agroecosystem Research (LTAR) Manuresheds: Redesigning Crop-Livestock Agriculture for Sustainable Intensification* (2018-ongoing) – Expertise and Author. USDA-ARS project explores geographic manure nutrient densities and utilization opportunities on scale from national to neighborhood levels.
 - *Advancing Manure Management by Providing Improved Guidance and Methodologies to Manure Testing Laboratories through the Manure Analysis Proficiency (MAP) Program* (2018-2022) – Author in national group that wrote the 2nd Edition of the manure analysis handbook *Recommended Methods for Manure Analysis, 2nd Edition* (2022). Funded through USDA-NRCS.
 - *Water4Ag. Securing Water for and from Agriculture through Effective Community & Stakeholder Engagement* (funded November 2016) – Expertise and Outreach teams on \$4,999,923 project in Pennsylvania, Nebraska, and Arizona.
 - *Sustainable Cropping Systems for Dairy Farms in the Northeastern US* (NESARE, funded 2008-2019) – Farm Research and Expertise teams. Outreach team.
 - *Enteric and Manure Methane Emissions from Livestock in the U.S.* (Exxon Mobil, 2015-2016). The project produced county-level emission map of enteric and manure storage methane release for cattle, swine, and poultry. Lead researcher and model developer for manure storage emission components of the project.
 - *Manure Injection and Incorporation Expert Panel* (Chesapeake Bay Watershed Research and Outreach Collaborative, 2015-2017). Panelist and lead for literature review. Project provided data and recommendations of loss factors used in the Chesapeake Bay Phase 6 Model for estimating nitrogen and phosphorus contributions to waters following manure injection.
 - *Manure Technologies Expert Panel* (Chesapeake Bay Watershed Research and Outreach Collaborative, 2014-2016). Panelist. Project provide data and recommendations of loss factors used in the Chesapeake Bay Phase 6 Model for estimating nitrogen and phosphorus contributions to waters from treated manures (e.g., composting, anaerobic digestion, gasification, etc.).

- *Biosecurity and Risk Factors Associated with Swine: Management Systems, Herd Susceptibility, and Potential Zoonotic Exposures* (PA Department of Agriculture, Animal Health & Diagnostic Commission, 2014-2015) – Co-PI, Outreach team.
- *Manure Gas Risks Associated with Gypsum Bedding at Dairy Farms* (NRCS-CIG, 2013-2015) – Investigator, Outreach, Expertise and Research teams.
- *Mitigation of Greenhouse Gas Emissions in Livestock Production; Regionally Appropriate and Effective Livestock Non-CO₂ Mitigation Packages* (FAO of the United Nations, 2011) – Literature Review and Co-Author of swine and poultry sections of comprehensive international review project.
- *Upper Kishacoquillas Creek Nutrient and Sediment Management Project* (NFWF, 2011-2013) – Outreach and Expertise teams.
- *Promoting Adoption of Innovative Conservation Cropping System on Livestock Farms* (NRCS-CIG, 2009-2012) – Co-PI. Leadership, Farm Research and Expertise teams.
- *Conewago Creek Conservation Initiative* (NFWF, 2009-2011) – Leadership and Expertise teams.
- *Chesapeake Dairy Sustainability Project* (NFWF, 2008-2010) – Expertise team.
- *Schuylkill Action Network* (Partnership of the Delaware Estuary, 2006-2008) – Outreach and Field Implementation teams.

Additional Activities

Penn State Center for Biorenewables

- Inaugural member (2019).

USDA Expert Workshops 2018. GHG Inventory: Manure Management Sector

- Panelist of this advisory group to the USDA and EPA charged to increase accuracy of management and emission factors used to predict Greenhouse Gas emissions from manure systems.

Pennsylvania Farm Show

- Chairman of Junior Market Swine Show, 2011 - present.
- Committee member of Junior Market Swine Show, 2000 - present.

Swine Industry

- ASF (African Swine Fever) Preparedness Task Force and 3D (Depopulation, Disposal, Decontamination) Subcommittee Team Member (2019 - present).
- Pork Quality Assurance (PQA) Plus Advisor Trainer, a train-the-trainer position that allows certification of others in the Northeast to act as producer Advisors.
- Advisor for this producer education and certification program that highlights management fundamentals of swine health, welfare, and husbandry.

Composting of Agricultural Wastes

- Deliver extension programming on composting issues, with emphasis on livestock mortality composting.
- Member of Composting Team Hotline of the Penn State Education Advisory Council.

Livestock & Poultry Environmental Learning Community (LPELC) / eXtension

- Routine participant of LPELC national peer exchange network.
- Member of the "Ask the Expert" team of this national educational web-based network.

2016 & 2019 PA in the Balance Conferences

- Invited participant to collaborative forum to advance agriculture and water quality.

PennAg Industries Manure Hauler and Broker Council

- Key catalyst for 2004 council formation and council advisor since its establishment.

2010 Chesapeake Manure Summit

- Key committee member of this event that hosted 60 legislative, agency, policy, and educational decision makers from the entire Bay region in a workshop forum that explored the future of environmental policy pertaining to livestock and agricultural nutrient pollution.

USDA-NRCS Feed Management Subcommittee of the PA State Technical Committee

- Swine representative. Exploration of potential environmental solutions through Feed Management.

Air Quality Subcommittee to NRCS State Technical Advisory Committee

- Member. Provide technical guidance on agricultural air quality issues and technologies.

Pennsylvania Humane Society Police Officer Training

- Provide education on large-animal farm scenarios during Humane Office Certification.

W. B. Saul Agricultural High School (Philadelphia, PA)

- Member of Saul Occupational Advisory Board and Ag Ecology Advisory Board (2005-2017).

A. B. Ross Leadership Program (2013 & 2019)

- Educator in this 4-H program geared towards education of future conservationists.
- Recognized as 2013 1st Place Search for Excellence in Teen Programming Award – Team by the PA Association of Extension 4-H Agents.

Pine Hurst Acres Swine Manure Digester

- Investigator and advisor for innovative swine manure digestion and methane cogeneration project. Lead researcher for animal behavior, living space air quality, and financial analysis of the project.
- Initiated Pennsylvania's first farm-level carbon credit trading.
- The digester was the subject of my Masters of Animal Science project.

Jamaican Digester Project

- Advisory role in educational exchange program between Penn State University's College of Engineering and the University of Technology, Kingston, Jamaica.
- Under this USDA funded program, students from each university shared educational visits while designing a methane digester that is operating at a Jamaican poultry and dairy farm.

Manure Du Jour Webinar Series

- Committee co-founder, speaker, and host for 2009 educational webinar series, one of the first webinar series provided by the College of Agriculture.

Pennsylvania Environmental Agricultural Conservation Certification of Excellence (PEACCE) program (2000-2009)

- President of PEACCE Board. The board consisted of voting members from the Pennsylvania Association of Conservation Districts, the Pennsylvania Environmental Council, and the Pennsylvania State University.
- Developer of program components and policy.
- PEACCE certified livestock farms that met or exceeded environmental compliance and stewardship criteria established by the program.
- Eighty-six farms in 17 PA counties were certified.

On-Farm Assessment and Environmental Review (OFAER)

- Certified assessor for national, comprehensive, non-regulatory, environmental farm assessment program that provided reports to producers concerning operation and management impacts on nutrient, odor, greenhouse gases, worker safety, animal welfare, and community image (EPA funded 2001-2005).

Pennsylvania Environmental Awareness Course

- Lead educator and administrator for this required component of PEACCE.
- Over 1,200 agricultural producers completed the course.

Department of Animal Science Social Committee

- Committee Chair (2004-2022).
- Safety Monitor for building evacuation situations.

Department of Animal Science Staff Advisory Committee to the Dean

- Department Representative (September 2021-2024 term).

Department of Animal Science Ag Progress Days Committee

- 2018-19 Chair. 2017-18 Assistant Committee Chair.

STATEMENT OF DIVERSITY AND INCLUSION:

Contributing to inclusive culture and community is important to me. I strive to operate in a manner that welcomes diversity, promotes individuality, and fosters equity. This includes a history and commitment to advance teaching and mentoring of people from all cultures, backgrounds, experiences, and worldviews. Differences do make us stronger together.

PREVIOUS WORK EXPERIENCE:

Purina Mills, Inc. (1994 – 2000)

Farm Manager, Wide Awake Farm, Clearville, PA

Farm Management, 1994-2000.

- Management Trainee, Milton, DE. January to September 1994.
- Promoted to Wide Awake Farm Assistant Manager, September 1994.
- Promoted to Farm Manager, July 1997.
- Wide Awake Farm, a 1,250-sow farrow-to-feeder farm and gilt multiplier for PIC genetics.

Production.

- Recognized as 'Top Producing Sow Herd' by Purina Mills in 1998 and 1999.
- Received PIC's Gold Performance Award in 1997, 1998 and 1999.
- One of only two Purina Mills employees to reach 150% of all personal performance review goals in 1999.
- The following table provides some key farm production efficiency indicators:

	1997	1998	1999	Goal
Pigs Weaned	23,365	25,256	29,011	24,960
Pigs Weaned per Crate per Year	121.7	131.5	151.1	130
Pigs Weaned per Mated Female per Year	22.7	23.3	24.6	21.5
Dollar Costs per Marketable Pound	0.99	1.01	0.96	0.96

Environmental Stewardship.

- Winner of national 1999 *Pork Industry Environmental Stewardship Award*.
- Implementation of industry leading environmental stewardship program.
- State industry leader in Nutrient Management Planning and mortality composting.
- Responsible for all farm cropping operations and manure application.

Management duties.

- Responsible for all production aspects including management efficiencies, herd health, and Pork Quality Assurance program.
- Plotting business strategy for growth, profitability, positive community image, and internal morale.
- Hire, train, and manage internal production staff. Prepare management trainees for management at other sites. Building team approach to goal achievement.
- Synchronize all animal transfers; maintain inventories; ordering of all farm supplies, semen, and feed; maintenance of farm equipment and roadside appeal.

Orkin Pest Control (1993)

Farm Service Technician, Certified pesticide applicator. York, PA

Pesticide Management.

- Maintained and performed all client scheduling and services for developmental fly pesticide management program on dairy operations in a 7-county service area of Southcentral Pennsylvania.

HONORS, CERTIFICATIONS, TRAININGS:

- 2025. Reporting Suspected Child Abuse (certificate).
- 2025-07-15. Penn State Fleet Defense. Van Training: Challenges of Driving Passenger Vans and Safely Transporting Passengers.
- 2025. Clery Act Training (certificate).
- 2025 Extension Team Award, Impact in Programming. Poultry Team. Recognized at 2025 Penn State Extension Annual Conference for response efforts concerning Highly Pathogenic Avian Influenza.

- 2025. Top Viewed Article. Agronomy Journal. *Recalibrating the Pennsylvania pre-sidedress soil nitrate test recommendations for modern corn production*. Top 10% of viewed articles published in 2023.
- 2025. Values, Ethics and Compliance at Penn State (certificate).
- 2025. The Art and Science of Communication (certificate).
- 2025. BUILD @ Penn State Track 3 – Skills for Building a Culture of Inclusion (certificate).
- 2025. Reporting Suspected Child Abuse (certificate).
- 2024. Recognized for Top 10 Cited Article by the Journal of Environmental Quality (January 1, 2022-December 31, 2023) for Meinen, et. al., 2022, *Opportunities to implement manureshed management in Iowa, North Carolina, and Pennsylvania swine industry*.
- 2024. Values, Ethics and Compliance at Penn State (certificate).
- 2024. BUILD for Leaders: Adopting a New Leadership Mindset to drive DEIB (certificate).
- 2024. Reporting Suspected Child Abuse (certificate).
- 2024. BUILD @ Penn State Track 2 – Adopting an Inclusion Mindset at Work (certificate).
- 2023 PA Governor's Award for Environmental Excellence, For 2022 North American Manure Expo. Meinen a co-chair. This is the highest environmental honor bestowed in the state of Pennsylvania.
- 2023. Understanding Civil Rights for the Penn State College of Agricultural Sciences (certificate).
- 2023. Values, Ethics and Compliance at Penn State (certificate).
- 2023. BUILD @ Penn State Track 1 – Recognizing the Importance of Inclusion in the Workplace (certificate).
- 2022. Master Well Owners Network Certification.
- 2022 Extension Director's Award, EXCELLENCE - Programming Team Award. Penn State Extension Water Team.
- 2021 Programming Team Excellence Award, Director's Awards, Penn State Extension Annual Conference. For *Roadside Guide to Clean Water*. Penn State Extension Water Team.
- 2021 Association of Natural Resources Extension Professionals (ANREP) Outstanding Educational Materials Awards, Silver Award for Long Publications. For *Roadside Guide to Clean Water: Manure Storage and Application*.
- 2020 PA Governor's Award for Environmental Excellence. For Manure Management Planning for Youth Animal Projects. Meinen a contributor. This is the highest environmental honor bestowed in the state of Pennsylvania.
- 2016 PA Governor's Award for Environmental Excellence, For 2015 North American Manure Expo. Meinen a co-chair. This is the highest environmental honor bestowed in the state of Pennsylvania.
- 2016 Ambassador Award: College of Agricultural Sciences Staff Laureate Awards.
- Pork Quality Assurance Plus. Advisor Trainer and Producer Advisor (2001-2023).
- Delta Theta Sigma Fraternity. Honorary Alumni (2016-present).
- Gamma Sigma Delta: The Honor Society of Agriculture. Member (2015-present).
- Sigma Tau Gamma Fraternity. Faculty Advisor (2000-2021), Alumni Association President (1997-2005), and president of LLC that constructed and managed \$1,300,000 fraternity property (2003-2021).
- Stewards of Children Training. Certificate (May 2016).
- College of Agricultural Science Faculty Leadership Program (August 2014).
- 2013 Search for Excellence in Teen Programming Award – Team. 1st Place, PA Association of Extension 4-H Agents.
- Pennsylvania Act 38 Nutrient Management Plan Writing certification (2001).
- On-Farm Assessment and Environmental Review (OFAER). Certified farm assessor (2001-2005 program end).
- 1999 Pork Industry Environmental Stewardship Award. The swine industries most prestigious award in the United States.

- 1999 Purina Mills 'Top Producing Sow Herd'. Best sow herd performance nationally.
- 1999 PIC Gold Performance Award. Sow herd in top 5% of national performance.
- 1998 Purina Mills 'Top Producing Sow Herd'. Best sow herd performance nationally.
- 1998 PIC Gold Performance Award. Sow herd in top 5% of national performance.
- 1997 PIC Gold Performance Award. Sow herd in top 5% of national performance.

PUBLICATIONS:

1. Zhao, Y., Bai, Z., Meinen, R.J., Luo, j., and Ma, L. Spatiotemporal trends and driving forces of pig production in China and the United States. *Earth Critical Zone*. June 23, 2025. <https://doi.org/10.1016/j.ecz.2025.100036>
1. Meinen, R.J., Flynn, K.C., Erb, K., Yost, J.L., Inaoka, M., and Spiegel, S. *Cleaner Waste Systems. Manure handling certification programs in manuresheds across the United States*. Proceedings of 2025 Waste to Worth Conference. Boise, Idaho. April 2025. <https://pelc.org/summary-of-manure-handling-certification-programs-across-the-united-states/>
2. Flynn, K.C., Erb, K., Meinen, R.J., Yost, J. L., Inaoka, M., Spiegel, S. *Navigating Manuresheds: Manure Handling Certification Programs Across the Contiguous United States*. Poster. American Association of Geographers Annual Meeting. Detroit, MI. March 2025. Presented by K. C. Flynn.
3. Flynn, K.C., Erb, K., Meinen, R.J., Yost, J.L., Inaoka, M., Spiegel, S. *Manure Handling Certification Programs in Manuresheds Across the United States. Cleaner Waste Systems*. February 27, 2025. <https://doi.org/10.1016/j.clwas.2025.100241>
4. Davidson, E., Dennison, B., Gu, B., Ti, C., Wang, Y., Yan, X., Zhang, X., Chen, D., Lam, S. K., Liang, D., Liang, X., Meinen, R., Zhu, Y., Chen, Y., Cheng, L., Deng, O., Dong, J., Duan, J., Huang, J., Li, G., Liu, Z., Ren, C., Shen, L., Tang, Z., Yang, H., Zheng, M., and Zou, Y. *Hangzhou Joint Statement. Advancing U.S.-China Cooperation on Nitrogen Management and N₂O Reduction for Climate Action*. Action statement from joint U.S. National Science Foundation (NSF) and National Science Foundation of China (NSFC) Conference. Zhejiang University, Hangzhou, China. September 18, 2024. <https://www.umces.edu/news/advancing-us-china-cooperation-on-nitrogen-management-and-n2o-reduction-for-climate-action> and <https://www.umces.edu/sites/default/files/Hangzhou%20Joint%20Statement.pdf>.
5. Meinen, R., White, C., Karsten, H., Spargo, J., and Sigdel, S. *Pre-sidedress Soil Nitrate Test for Corn*. Penn State Extension Fact Sheet. May 2024. <https://extension.psu.edu/pre-sidedress-soil-nitrate-test-for-corn>
6. Erb, K., Inaoka, M., and Meinen, R. *State Level Manure Broker, For-Hire Manure Applicator, and Livestock Producer Training and Certification Program Inventory 2024*. Dataset repository with Minds@UW. April 2024. <http://digital.library.wisc.edu/1793/85156>
7. Robert J. Meinen and EnergyWorks team members. *Unlocking the Benefits of Advanced Manure Treatment Technologies to Meet the Chesapeake Bay TMDL Challenge*. White paper with unique endorsement update mechanism. January 2024. <https://drive.google.com/drive/folders/1MPbQnA5zspMrXkIKYl3n6yFRvcqtfnC>
8. Robert James Meinen. *Development of Soil Testing Protocol in Soils Receiving Shallow Disc Manure Injection. A Dissertation in Soil Science*. Penn State University Libraries, Electronic Theses and Dissertations for Graduate School. August 2023. Download at <https://etda.libraries.psu.edu/catalog/21714rjm134>
9. White, C M., Sigdel, S., Karsten, H. D., Meinen, R. J., and Spargo, J. (2023). Recalibrating the Pennsylvania Pre-Sidedress Soil Nitrate Test Recommendations for Modern Corn Production. *Agronomy Journal*, 1-14. <http://doi.org/10.1002/agj2.21426>
10. K. C. Flynn, S. Spiegel, P. J. A. Kleinman, R. J. Meinen, and D. R. Smith. Manureshed management to overcome longstanding nutrient imbalances in US agriculture. *Resources, Conservation & Recycling*. January 2023. <https://doi.org/10.1016/j.resconrec.2022.106632>
11. Meinen, R. J., Beegle, D. B., Vishwanath, S., Kleinman, P. J. A., Saporito, L. S., Spargo, J., Karsten, H. & Dillon, J. (2022). Monolith Soil Core Sampling to Develop Nitrate Testing Protocol for Manure Injection. *Soil Science Society of America Journal*, 00, 1-12.

- <https://doi.org/10.1002/saj2.20509>
12. Wilson, M., Cortus, S., Brimmer, R., Floren, J., Gunderson, L., Hicks, K., Hoerner, T., Lessl, J., Meinen, R. J., Miller, R. O., Mowrer, J., Porter, J., Spargo, J. T., Thayer, B., and Vocasek, F. *Recommended Methods of Manure Analysis, 2nd Edition*. May 2022. <https://conservancy.umn.edu/handle/11299/227650>
 13. Meinen, R. J., Spiegel, S., Kleinman, P. J. A., Flynn, K. C., Goslee, S. C., Mikesell, R. E., Church, C., Bryant, R. B., & Boggess, M. (2022). Opportunities to implement manureshed management in the Iowa, North Carolina, and Pennsylvania swine industry. *Journal of Environmental Quality*, 1–11. March 2022. <https://doi.org/10.1002/jeq2.20340> Recognized as Top 10 cited article for JEQ, January 1, 2022–December 31, 2023.
 14. R. Bryant, E. Dinku, S. Spiegel, C. Flynn, R. Meinen, M. Cavigelli, P. Kleinman. Poultry Manureshed Management: Opportunities and Challenges for a Vertically Integrated Industry. *Journal of Environmental Quality*, Special Edition. September 2021. Recognized with certificate as a Top Cited Article 2021–2022 by Wiley. <https://doi.org/10.1002/jeq2.20273>
 15. R. Meinen. *Reaping the benefits: Nutrient and manure management planning policies should accommodate precision agriculture technologies*. Manure Manager. May/June 2020. <https://www.manuremanager.com/reaping-the-benefits/>
 16. S. Spiegel, P. Kleinman, D. Endale, R. Bryant, C. Dell, S. Goslee, R. Meinen, C. Flynn, J. Baker, D. Browning, G. McCarty, S. Bittman, J. Carter, M. Cavigelli, E. Duncan, P. Gowda, X. Li, G. Ponce-Campos, R. Cibin, M. Silveira, D. Smith, D. Arthur, Q. C. Yang. Manuresheds: Advancing Nutrient Recycling in US Agriculture. *Agricultural Systems*; 182; June 2020. <https://doi.org/10.1016/j.agsv.2020.102813>
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 19. R. Meinen and L. Ressler. *Roadside Guide to Clean Water: Manure Storage and Application*. Brief online component of Roadside Guide to Clean Water Series of the Penn State Extension Water Team. <https://extension.psu.edu/roadside-guide-to-clean-water-manure-storage-and-application>
 20. R. Meinen. *Nutrient and Manure Management Planning Policies Should Accommodate Advancing Precision Agriculture Technologies*. White Paper. March 2020.
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 23. A. Hristov, M. Harper, R. Meinen, R. Day, J. Lopes, T. Ott, A. Venkatesh, C. Randles. Discrepancies and Uncertainties in Bottom-up Gridded Inventories of Livestock Methane Emissions for the Contiguous United States. *Environmental Science & Technology Journal*. November 2017. <https://pubs.acs.org/doi/pdf/10.1021/acs.est.7b03332>
 24. E. E. Fabian-Wheeler, M. L. Hile, D. J. Murphy, D. E. Hill, R. Meinen, R. C. Brandt, H. A. Elliott, D. Hofstetter. Operator Exposure to Hydrogen Sulfide from Dairy Manure Storages Containing Gypsum Bedding. *Journal of Agricultural Safety and Health*. *Journal of Agricultural Safety and Health*. Volume 23(1). January 2017. https://www.researchgate.net/publication/316561237_Operator_Exposure_to_Hydrogen_Sulfide_from_Dairy_Manure_Storages_Containing_Gypsum_Bedding
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https://www.chesapeakebay.net/documents/Phase_6_FINAL_MII_Final_Report.pdf
 27. D. Hamilton, R. Meinen, K. Cantrell, J. Chastain, A. Ludwig, J. Ogejo, J. Porter, with J. Hanson, B. Benham, C. Brosch, M. Dubin, A. Toy, D. Wood. *Manure Treatment Technologies: Recommendations from the Manure Treatment Technologies Expert Panel to the Chesapeake Bay Program's Water Quality Goal Implementation Team to Define Manure Treatment Technologies as a Best Management Practice*. Chesapeake Bay Agriculture Work Group. October 2016.
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 29. Meinen, R. *Proceedings: 2014 Advanced Topics in Feed Management Conference. Understanding Manure Nutrient Pathways: Helping Nutritionists See a Bigger Picture*. Lancaster, PA. May 8, 2014.
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<https://doi.org/10.1016/j.biombioe.2014.01.032>
 31. F. Montes, R. Meinen, C. Dell, A. Rotz, A. N. Hristov, J. Oh, G. Waghorn, P. J. Gerber, B. Henderson, H. P. S. Makkar, and J. Dijkstra. Mitigation of methane and nitrous oxide emissions from animal operations: II. A review of manure management mitigation options. *Journal of Animal Science*. December 2013. <https://doi.org/10.2527/jas.2013-6584>
 32. P. J. Gerber, A. N. Hristov, B. Henderson, H. Makkar, J. Oh, C. Lee, R. Meinen, F. Montes, T. Ott, J. Firkins, A. Rotz, C. Dell, A. T. Adesogan, W. Z. Yang, J. M. Tricarico, E. Kebreab, G. Waghorn, J. Dijkstra, and S. Oosting. Technical options for the mitigation of direct methane and nitrous oxide emissions from livestock: a review. *Animal*. June 2013.
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https://www.researchgate.net/publication/317342437_Nutritional_and_management_strategies_to_mitigate_animal_greenhouse_gas_emissions
 35. Peter Kleinman, Kristen Saacke Blunk, Ray Bryant, Lou Saporito, Doug Beegle, Karl Czymmek, Quirine Ketterings, Tom Sims, Jim Shortle, Josh McGrath, Frank Coale, Mark Dubin, Daniel Dostie, Rory Maguire, Robb Meinen, Arthur Allen, Kelly O'Neill, Lamonte Garber, Mark Davis, Bobby Clark, Kevin Sellner, and Matt Smith. *Managing manure for sustainable livestock production in the Chesapeake Bay Watershed*. *Journal of Soil and Water Conservation*. March/April 2012.
https://www.researchgate.net/publication/273268483_Managing_manure_for_sustainable_livestock_production_in_the_Chesapeake_Bay_Watershed
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39. R. J. Meinen. *Evaluation of economic feasibility and animal performance for a novel manure collection and anaerobic digestion system at a commercial swine finisher enterprise*. The Pennsylvania State University. Master's Thesis. 2008.
40. V. Ishler, A. Dodd, C. Abdalla, G. Martin, R.J. Meinen, R.E. Mikesell, and J.L. Weld. Agricultural Environmental Programming in Pennsylvania: Increasing Visibility and Relevancy of Extension. *Journal of Extension*. Volume 44(4). August 2006. <https://archives.joe.org/joe/2006august/a7.php>
41. R. J. Meinen, K. B. Kephart, and R. E. Graves. Development of a Novel Manure Collection System for a Large-Room Swine Finishing Facility and an Anaerobic Digester. Proceedings: *2005 Animal Waste Symposium*. October 5-7, 2005. Research Triangle Park, NC.
42. V. Ishler, A. Dodd, R. Meinen, B. Mikesell, C. Abdalla, G. Martin, and J. Weld. Agricultural-environmental programing in Pennsylvania: making connections, building capacity, increasing credibility. *Journal of Dairy Science*. Volume 88, 2005.
43. R. J. Meinen. Environmental Certification – The PEACCE Program. 2004 National Poultry Waste Management Symposium Proceedings. October 24-26, 2004. Memphis, TN.
44. V. Ishler, R. J. Meinen, S. Roth, and R. Stup. *Contracting Certified Manure Haulers*. Manure Manager Magazine. September/October 2004.
45. V. Ishler, R. Meinen, S. Roth and R. Stup. *Contracting Certified Manure Haulers*. Penn State University Fact Sheet. 2002.
46. R. J. Meinen, K. B. Kephart, and L. J. Ressler. Teaching environmental stewardship to commercial manure haulers through a certification program. Proceedings: *ASAS Annual Meeting*. July 22-26, 2002. Quebec City, Quebec.

SELECT PRESENTATIONS:

1. **C-Change: Lessons Learned from Denmark's Biogas Industry.** Panelist on webinar of the Penn State Extension Energy Team. November 11, 2025. https://psu.mediaspace.kaltura.com/media/C-CHANGE:+Lessons+Learned+from+Denmark's+Biogas+Industry--Webinar+on+11+11+25/1_z7z07ecs
2. **Columbia County PFAS Forum.** Speaker and panelist at public forum. August 28, 2025.
3. **2025 Ag Progress Days. Biogas and Energy Transmission.** Panelist on this in-person session that was recorded for video airing on the Pennsylvania Cable Network (PCN). August 12, 2025. <https://pcnselect.com/videoplayer.php?id=6376954964112&b=home>
4. **2025 Waste to Worth Conference.** *Manure handling certification programs in manuresheds across the United States*. Proceedings of 2025 Waste to Worth Conference. Boise, Idaho. April 10, 2025. Recording available: <https://lpeic.org/summary-of-manure-handling-certification-programs-across-the-united-states/>
5. **Pennsylvania No-Till Alliance.** *The Pros and Cons of Manure Injection*. January 23, 2025.
6. **Penn State Ag Council.** *Land Application Challenges*. Food Processing Waste on Ag Lands meeting. State College, PA. October 17, 2024.
7. **International Workshop on Soil Health and Environment.** *Insights Gained from Manureshed Research*. Hangzhou Zhejiang, Zhejiang University, China. September 18-22, 2024.
8. **Livestock and Poultry Environmental Learning Community: Monthly Webinar.** *Implications of Manure Additives: Both Purposeful & Accidental*. Webinar Moderator. September 2023.
9. **Mid-Atlantic Biosolids Association.** *Manureshed Management Concepts for Biosolids-borne Phosphorus*. Webinar presenter. September 2023.
10. **2022 North American Manure Expo.** *Manure Spill Response Demonstration and Manure Application Technology Demonstrations*. Chambersburg, PA. July 2022.

11. **2022 Waste to Worth Conference.** Meinen, R. J., S. Spiegel, P. J. A. Kleinman, K. C. Flynn, S. C. Goslee, R. E. Mikesell, C. Church, R. B. Bryant, and M. Boggess. 2022. Manuresheds: Pennsylvania Case Study of Strategic Expansion of the Swine and Poultry Industries. Proceedings: 2022 Waste to Worth Conference. Oregon, OH. <https://lpec.org/manuresheds-pennsylvania-case-study-of-strategic-expansion-of-the-swine-and-poultry-industries/>
12. **2022 Waste to Worth Conference.** Bryant, R. B., D. M. Endale, D. M., S. A. Spiegel, K. C. Flynn, R. J. Meinen, M. A. Cavigelli, and P. J. A. Kleinman. 2022. The Poultry Mega-Manureshed that is the Southeastern USA: Is It Sustainable? Proceedings: 2022 Waste to Worth Conference. Oregon, OH. <https://lpec.org/the-poultry-mega-manureshed-that-is-the-southeastern-usa-is-it-sustainable/>
13. **2022 Michigan Manure Summit.** *Manure Storage & Gas Safety Considerations.* Virtual presentation. February 2022.
14. **2021 American Geophysical Union (AGU) Fall Meeting.** *Manuresheds: reconnecting crop and livestock production to improve sustainability and introduce circularity.* American Geophysical Union. Flynn, K.C., S. Spiegel, P. Kleinman, R. Meinen, and D. Smith. Presented by Colton Flynn. New Orleans, LA. December 2021.
15. **2020 ASA, CSSA and SSSA International Annual Meeting. Translating Visionary Science to Practice.** *Opportunities to Implement Manureshed Management in the U.S. Swine Industry.* Virtual, November 2020.
16. **2020 ASA, CSSA and SSSA International Annual Meeting. Translating Visionary Science to Practice.** *Symposium—Manuresheds – Reconnecting Crop and Livestock Production Systems for Sustainable Resource Management II.* Virtual, November 2020.
17. **2020 Mid-Atlantic Manure Summit.** *Foundational Nutrient Concepts Everyone Utilizing Manure Should Know.* Manheim, PA. February 2020.
18. **2019 North American Manure Expo.** *Foundational Nutrient Concepts Everyone Utilizing Manure Should Know.* Fair Oaks, IN. August 2019.
19. **2019 Waste to Worth Conference.** Meinen, R. J. 2019. Survey of Pennsylvania Manure Hauler and Broker Certification Program. Proceedings: 2019 Waste to Worth Conference. Minneapolis, MN. <https://lpec.org/survey-of-pennsylvania-manure-hauler-and-broker-certification-program/>
20. **2019 Waste to Worth Conference.** Meinen, R. J. 2019. Spatial and Temporal Soil Nitrogen Distribution After Shallow Disk Injection in Corn. Proceedings: 2019 Waste to Worth Conference. Minneapolis, MN. <https://lpec.org/spatial-and-temporal-soil-nitrogen-distribution-after-shallow-disk-manure-injection-in-corn/>
21. **2017 Waste to Worth Conference.** Meinen, R. J., C. Dell, A. Allen, D. Dostie, M. Dubin, L. Gordon, R. Maguire, D. Meals, C. Brosch, and J. Sweeney. 2017. Recommendations for Manure Injection and Incorporation Technologies for Phase 6 Chesapeake Bay Watershed Model. Proceedings: 2017 Waste to Worth Conference. Cary, NC. <https://lpec.org/recommendations-for-manure-injection-and-incorporation-technologies-for-phase-6-chesapeake-bay-watershed-model/>
22. **2017 Waste to Worth Conference.** Meinen, R. J., A. Hristov, and M. Harper. 2017. Livestock Methane Emissions Estimated and Mapped at a County-level Scale for the Contiguous United States. Proceedings: 2017 Waste to Worth Conference. Cary, NC. <https://lpec.org/livestock-methane-emissions-estimated-and-mapped-at-a-county-level-scale-for-the-contiguous-united-states/>
23. **2016 North American Manure Expo.** *Manure Spill Response Demonstration and Manure Application Technology Demonstrations.* London, OH. August 2016.
24. **2015 North American Manure Expo.** *Manure Spill Response Demonstration and Manure Application Technology Demonstrations.* Chambersburg, PA. July 2015.
25. **2015 Waste to Worth Conference: Advancing Sustainability in Animal Agriculture.** Meinen, R. J., D. Beegle, P. Kleinman, H. Karsten, and G. Malcolm. 2015. Soil Nitrate Testing Protocol Development for Lands Receiving Injected Manure. Proceedings: 2015 Waste to Worth Conference. Seattle, WA. <https://lpec.org/soil-nitrate-testing-protocol-development-for-lands-receiving-injected-manure/>
26. **2014 North American Manure Expo.** *Manure Gas and Safety.* Springfield, MO. July 2014.
27. **2014 Advanced Topics in Feed Management Conference.** *Understanding Manure Nutrient Pathways: Helping Nutritionists See a Bigger Picture.* Lancaster, PA. May 8, 2014.
28. **2013 North American Manure Expo.** *Manure Gas that Doesn't Stink – Beware!* Guelph, ON, Canada. August 2013.

29. **2013 Waste to Worth Conference: “Spreading” Science & Solutions.** Meinen, R., D. Hill, R. Larson, A. Ozkaynak, D. Murphy, E. Fabian Wheeler, R. Brandt, and H. Elliot. 2013. Gypsum Bedding – Risk and Recommendations for Manure Handling. Proceedings: 2013 Waste to Worth Conference. Denver, CO. <https://pelc.org/gypsum-bedding-risks-and-recommendations-for-manure-handling/>
30. **2013 Waste to Worth Conference: “Spreading” Science & Solutions.** Ishler, V., R. Meinen, H. K. Karsten, and G. Malcolm. 2013. Sustainable Dairy Cropping Systems. Proceedings: 2013 Waste to Worth Conference. Denver, CO. <https://pelc.org/sustainable-dairy-cropping-systems/>
31. **2013 Conservation Tillage & Technology Conference.** *Update on Manure Injection Research in Pennsylvania.* Ada, OH. March 2013.
32. **2013 Conservation Tillage & Technology Conference.** *Manure Storage Safety: Guidance for Managers & Workers.* Ada, OH. March 2013.
33. **10-State Extension Program.** *The Chesapeake Bay TMDL Spurs Changes in Pennsylvania Manure Management.* Marshall, MI. June 2012.
34. **2010 North American Manure Expo.** Manure Spill Response Demonstration and Manure Application Technology Demonstrations. July 2010.
35. **Pennsylvania Association of Meat Processors 2009 Convention.** *Composting of Slaughterhouse Wastes.* State College, PA. May 2009.
36. **2008 Great Lakes Manure Expo.** *Stockpiling Manure.* London, OH. July 2008.
37. **2008 Great Lakes Manure Expo.** *Manure Spreader Calibration.* London, OH. July 2008.
38. **Environmental Management in Swine Production.** *Odor Regulation Development: A Pennsylvania Perspective.* Fargo, ND. January 2007.
39. **Environmental Management in Swine Production.** *Swine Manure Digester at Pine Hurst Acres – A Preliminary Report.* Fargo, ND. January 2007.
40. **Pennsylvania State Association of Township Supervisors.** *Managing the Agriculture/Residential Interface.* Hershey, PA. April 2006.
41. **Pennsylvania Clean Energy Expo.** *Swine Manure Digester at Pine Hurst Acres – A Preliminary Report.* University Park, PA. March 2006.
42. **Municipal Agriculture Issues Forum through the Ombudsman Program.** *Odor Management and Community Relations.* Five locations: Lancaster, Williamsport, Lebanon, Gettysburg and Aliquippa, PA. April 2004 through October 2006.
43. **2005 Animal Waste Management Symposium.** *Development of a Novel Manure Collection System for a Large-room Swine Facility and an Anaerobic Digester.* Research Triangle Park, NC. October 2005.
44. **Pennsylvania Nutrient Management Summit.** *4 PSU Programs.* Grantville, PA. March 2005.
45. **National Poultry Waste Management Symposium.** *The Pennsylvania Environmental Agricultural Conservation Certification of Excellence (PEACCE) Program.* Memphis, TN. October 2004.
46. **Wisconsin Professional Custom Operator Association Annual Conference.** *The Pennsylvania Environmental Agricultural Conservation Certification of Excellence (PEACCE) Program.* Wisconsin Dells, WI. January 2003.
47. **Wisconsin Professional Custom Operator Association Annual Conference.** *Common Sense on Odors.* Wisconsin Dells, WI. January 2003.
48. **Cornell Swine School.** *Odor Basics and the OFAER Program.* Ithaca, NY. March 2001.

ADDITIONAL SELECT PUBLICATIONS, WEB MATERIAL, RELAVANT ARTICLES:

1. *How Much Does That Bale Really Weigh? Feeding and Fertilizer Implications.* Penn State Extension. November 17, 2025. <https://extension.psu.edu/how-much-does-that-bale-really-weigh-feeding-and-fertilizer-implications>
2. *Comparing States’ Manure Handler Certifications.* Lancaster Farming. September 26, 2025. https://www.lancasterfarming.com/farming-news/ag-business/comparing-states-manure-handler-certifications/article_e29f499a-a440-4d54-a91c-e2f0ada3bc5a.html
3. *A certification cookie cutter doesn’t exist.* Journal of Nutrient Management. August 2025, pp. 16-17. https://issuu.com/havandforagegrower/docs/jnm_aug_2025_digital
4. *The Barnyard Broadcast: Episode 1.9: The Manure Equation: Balancing Productivity and Management.* Podcast guest. July 2025. <https://extension.psu.edu/the-barnyard-broadcast>

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5. *Getting More from Manure: Denmark Trip Shows Pennsylvanians the Possibilities of Biogas.* Lancaster Farming. July 20, 2025. Meinen interviewed.
https://www.lancasterfarming.com/farming-news/ag-business/getting-more-from-manure-denmark-trip-shows-pennsylvanians-the-possibilities-of-biogas/article_5ddb3c71-21da-4458-a684-3febd8e9f549.html
6. *Soil nitrate testing gets a facelift.* Journal of Nutrient Management. May 2025.
<https://jofnm.com/article-381-Soil-nitrate-testing-gets-a-facelift.html>
7. *PA farmers urged to minimize manure input on fields during winter.* Public News Service. February 17, 2025. Meinen interviewed for article which was also distributed to firm's radio network. <https://www.publicnewsservice.org/2025-02-17/rural-farming/pa-farmers-urged-to-minimize-manure-input-on-fields-during-winter/a95283-1>
8. *Manure Spills Response in Pennsylvania.* Brochure developed with PA Agricultural Ombudsman Program. 2025.
9. *Manure Spreading in Pennsylvania.* Brochure developed with PA Agricultural Ombudsman Program. 2025. <https://paagombudsman.com/wp-content/uploads/Manure-Spreading-in-PA-Brochure.pdf>
10. *Manure Injection Gaining Acceptance in No-Till Community.* Lancaster Farming. January 24, 2025. Coverage of Meinen presentation to PA No-Till Alliance.
https://www.lancasterfarming.com/farming-news/field-crops/manure-injection-gaining-acceptance-in-no-till-community/article_c3609ca8-da7a-11ef-897f-831e8984175f.html
11. *Passing the Smell Test.* Manure Manager magazine. December 17, 2024. Meinen interviewed.
<https://www.manuremanager.com/passing-the-smell-test/>
12. *The Do's and Don'ts of In-Field Manure Stacking.* Penn State Extension. December 10, 2024.
https://extension.psu.edu/the-dos-and-donts-of-in-field-manure-stacking?j=824622&sfmc_sub=35520156&l=159_HTML&u=21774534&mid=7234940&jb=2002&utm_medium=email&utm_source=MarketingCloud&utm_campaign=FAFC_2024_DEC_12_GN_EM_FIELDCROPNEWS&utm_content=FAFC_2024_DEC_12_GN_EM_FIELDCROPNEWS&subscriberkey=0030W00003P0yh8QAB
13. *Agronomy Highlights Podcast: S3E9: Do's and Don'ts of Winter Manure Spreading.* Penn State Extension's Field and Forage Crops Team. Podcast guest. November 2024.
<https://extension.psu.edu/agronomy-highlights>
14. *Manure Management Plan Overview and Connections to Resources.* Penn State Extension. October 14, 2024. https://extension.psu.edu/manure-management-plan-overview-and-connections-to-resources?j=816354&sfmc_sub=35520156&l=159_HTML&u=21579435&mid=7234940&jb=1002&utm_medium=email&utm_source=MarketingCloud&utm_campaign=WAQQ_2024_OCT_22_GN_EM_WATERSHEDWINDS&utm_content=WAQQ_2024_OCT_22_GN_EM_WATERSHEDWINDS&subscriberkey=0030W00003P0yh8QAB
15. *Composting: A Cost-Effective Solution for Livestock Disposal on Farms.* Lancaster Farming. September 24, 2024. Meinen interviewed. https://www.lancasterfarming.com/farming-news/conservation/mortality-composting-a-cost-effective-solution-for-livestock-disposal-on-farms/article_1fb7c8da-75dd-11ef-985c-9306e6045904.html
16. *Special podcast episode: On-the-ground Manure Expo highlights.* The Spread podcast. Manure Manager magazine. Meinen interviewed. https://www.manuremanager.com/podcasts/audio-highlights-2024-north-american-manure-expo/?oly_enc_id=5790A3378267D2Y
17. *Barn Renovation Improves Air Flow, Reduces Fly Risk.* Lancaster Farming. July 29, 2024. Article on field day with Meinen as lead organizer, moderator, and speaker.
https://www.lancasterfarming.com/farming-news/livestock/barn-renovation-improves-air-flow-reduces-fly-risk/article_a7b3b4f6-4a9f-11ef-b682-fb23d051ff47.html
18. *Penn State Releases New Pre-sidedress Nitrate Test for Corn.* Penn State Extension news. June 4, 2024.
<https://extension.psu.edu/penn-state-releases-new-pre-sidedress-nitrate-test-for-corn>
19. *Influential Women of Canadian Agriculture: Nomination for Christine Brown, Ontario Ministry of Agriculture, Food, and Rural Affairs.* March 2024. Nomination was successful.
<https://www.agwomen.ca/introducing-your-2024-influential-women-in-canadian-agriculture-2/>
20. *The Manure Crystal Ball: What can the manure management industry expect in 2024.* Manure Manager Magazine. March 20, 2024. Meinen was interviewed for this article. Digital magazine version: <https://mydigitalpublication.com/publication/?m=1559&i=817152&p=14&ver=html5>

21. *Possibilities and limitations: Manuresheds are a helpful concept, but there are still gaps to fill.* Manure Manager Magazine. March 12, 2024. Meinen was interviewed for this article. Digital magazine version: <https://mydigitalpublication.com/publication/?m=1559&i=814299&p=14&ver=html5> Online version: https://www.manuremanager.com/possibilities-and-limitations/?oly_enc_id=5790A3378267D2Y
22. *Safe and (bio)secure.* Manure Manager Magazine. January 16, 2024. Meinen was interviewed for this article. <https://www.manuremanager.com/safe-and-biosecure-2/>
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