



DELMARVA SOIL SUMMIT

FEBRUARY 26 & 27 | GEORGETOWN, DE

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2020 DELMARVA SOIL SUMMIT- AGENDA

Whether you farm 2 acres or 2,000 acres, this conference will deliver information that's relevant to your farm's scale and production type. We're bringing in experts from around the country, and bringing you the latest updates from researchers right here on Delmarva. With learning tracks and farmer panels for both large-scale commodity farmers and small-scale diversified growers, there's something here for everyone!

PRE-CONFERENCE WORKSHOP: PURPOSEFUL COVER CROPPING TRAINING

With Chris Lawrence and Sarah Hirsh

This special pre-conference workshop will help take your cover cropping to the next level! In this workshop, Chris Lawrence and Sarah Hirsh will walk you through the cover crop planning process, describing new tools and strategies to help you make sense of cover crops: 30+ species, 10+ purposes, 6 seasonal niches and 3 functional groups. They'll also share case studies to open your mind to new options... and to help you see those you ought to avoid!

9:00 - 12:00 in Room #535 A/B --- Separate ticket required.

FEBRUARY 26: RESEARCH & NETWORKING

12:00 – 1:00	Lunch - Main Room (540s)
GENERAL SESSION	
	Main Room (540s)
1:00 – 1:30	Official Kickoff of the Delmarva Soil Summit Welcome & Housekeeping <i>Jason Challandes, Delaware State University and Northeast SARE</i> <i>Kasey Taylor, State Conservationist, Delaware NRCS</i> <i>Kenneth Bounds, Deputy Secretary, DDA</i> <i>Shawn M. Garvin, Secretary, DNREC</i>

RESEARCH UPDATES- EARLY AFTERNOON BREAKOUT SESSIONS			
	<i>Room # 535C/D</i>	<i>Room # 535A/B</i>	<i>Room # 555A/B</i>
1:30 – 2:00	Extending Multi-Species Cover Crop Growing Season for Enhanced Function and Soil Health <i>Ray Weil, UMD</i>	Phosphorus in Delmarva Soils & Implications for Soil Health <i>Amy Shober, UD</i>	Cover Crop Decision Tools <i>Victoria Ackroyd, USDA ARS/UMD</i>
2:00 – 2:30	Soil Health Practices That Sequester Carbon Also Increase Profits <i>Sara Via, UMD</i>	How to Get SARE Farmer/Partnership Research Grants <i>Lisa Garfield, Farmer and Nevin Dawson, SARE</i>	Cover Crop Decision Tools (continued) <i>Victoria Ackroyd, USDA ARS/UMD</i>
2:30 – 3:00	Break & Visit with Exhibitors		
RESEARCH UPDATES- LATE AFTERNOON BREAKOUT SESSIONS			
	<i>Room # 535C/D</i>	<i>Room # 535A/B</i>	<i>Room # 555A/B</i>
3:00 – 3:30	Evaluating Single & Mixed Species Cover Crops <i>Mark Reiter, VT</i>	Quantitative Decision Making for Cover Crops <i>Charlie White, PSU</i> <i>(Remote Presentation via Zoom)</i>	Glyphosate Use & Impact on Soil Biology <i>Stephanie Yarwood, UMD</i>
3:30 – 4:00	Long-term conventional vs. organic management and rotation effects on soil fertility at the USDA-ARS Farming Systems Project <i>Kate White, USDA ARS</i>	Breeding Cover Crops for the Mid-Atlantic <i>Ginny Moore, USDA ARS</i>	Saltwater Intrusion & Salt Tolerant Crops <i>Dani Weissman, UMD</i>
PLENARY SESSION			
	<i>Main Room (540s)</i>		
4:10 – 5:00	Planting Green & Managing Slugs <i>John Tooker, PSU</i>		
	<i>Lobbies, Hallway & Lounge</i>		
5:00 – 7:30	Cover Crop Cocktail Party Join us for this networking event and poster session, featuring local beer and wine, free of charge. Thanks to Evolution Brewery in Salisbury, MD and Harvest Ridge in Marydel, DE for their support of this event!		

FEBRUARY 27: PLENARIES & BREAKOUTS

PLENARY SESSION				
	Main Room (540s)			
8:30 -9:00	Welcome & Housekeeping Jen Nelson, Resource Smart LLC David Baird, Sussex Conservation District Niamh Shortt, Future Harvest			
9:00- 10:00	Carbonomics Keith Berns, Farmer & Co-owner of Green Cover Seed			
10:00 – 11:00	Understanding Soil Biology & How It Works Kristine Nichols, KRIS Systems			
11:00 – 11:30	Break & Visit with Exhibitors			
11:30 – 12:10	Economics of Cover Crops Rob Myers, North Central SARE & University of Missouri			
12:10 – 12:30	Q&A			
12:30 – 1:15	Lunch			
EARLY AFTERNOON BREAKOUT SESSIONS				
1:20 – 2:20	Large-Scale/Commodity Production Track Room #540s/Main Area		Small Scale/Diversified Production Track	
	Large-Scale/Commodity Farmer Panel Discussion- Managing for Soil Health- Farm Goals, Challenges, Successes & Lessons Learned Moderator: Jen Nelson Featuring Jay Baxter (Baxter Farms), Matt Fry (Fair Hill Farm), Trey Hill (Harborview Farm) and Brad Ritter (Ritter Family Farms)		Soil Quality & Weed Control Dynamics Ben Beale, UME	Cover Cropping Efficiently on Biointensive Farms Nazirahk Amen, Farmer

MID-AFTERNOON BREAKOUT SESSIONS					
2:30 – 3:30	Large-Scale/Commodity Production Track			Small Scale/Diversified Production Track	
	Room # 535A/B	Room # 535C/D	Room #555A/B	Room #540s/Main Area	
	Machines & Equipment Modifications Steve Groff, Cover Crop Innovators	Separating Fact from Fiction in Soil Health Claims Bob Kratochvil, UMD	Beyond Rye & Clover: An Overview of Cover Crop Options Keith Berns, Green Cover Seed	Small Scale/Diversified Farmer Panel Discussion- Managing for Soil Health- Farm Goals, Challenges, Successes & Lessons Learned Moderator: Lisa Garfield Featuring Hattie Allen (Hattie’s Garden) , Thelonius Cook (Mighty Thundercloud Edible Forest), Zach Dittmar (Dittmar Family Farms) and Tom Paduano (Flying Plow Farm)	
3:30 – 4:00	Break & Visit with Exhibitors				
LATE AFTERNOON BREAKOUT SESSIONS					
	Room #540s/Main Area	Room #535A/B	Room #535C/D	Room #555A/B	
4:00 – 5:00	Reading & Interpreting Soil Tests & Measuring Change Bill Rohrer, AgroLab	No-till Veggies & No-Till Organic Steve Groff, Cover Crop Innovators	Economics of Soil Amendments & Biological Fertility - True Cost and Plant-Availability Daniel Sweeney, Seven Springs Farm	Grazing for Soil Health Brian Campbell, NRCS and Mark Way, Rumbleway Farm	

Nutrient Management/Crop Advisor CEUs

For those attendees who need CEUs for their nutrient management certifications, please see the registration desk for the appropriate form for your state. For Crop Advisor CEUs, sign-in sheets for the plenary sessions and farmer panels will be at the registration table, while sign-in sheets for breakout sessions will be in the individual classrooms.

Poster Presentation Abstracts

Belowground Impacts on Pollinator Nutrition

Grace Savoy-Burke 1; Deborah Delaney 1; Harsh Bais 1; Charles Mason 1; Jeff Buler 1. 1 University of Delaware

Pollination is a key natural resource contributing billions of dollars annually to U.S. agriculture. A primary goal in promoting these valuable services is providing nutritious forage for managed and wild bees. However, factors affecting the production of floral rewards (pollen and nectar) are not well understood. It cannot be assumed that simply increasing the number of flowers in the landscape is adequate without considering how management practices may alter abundance or quality of food provided by those blooms. Soil health, including the soil microbiome, play an important role in promoting plant growth, health, and reproduction, and thus are expected to also impact pollen and nectar production, but this connection has yet to be empirically studied. Furthermore, widely used agricultural chemicals such as herbicides may also alter floral rewards. Using a series of controlled greenhouse experiments, we will compare plants grown with an intact soil microbiome to plants with the microbiome experimentally removed. We then will explore the effects of the herbicide glyphosate on floral rewards. Changes in plant vegetative growth, flower phenology and phenotype, quantity and nutritional quality of pollen and nectar, and chemistry of plant volatiles involved in pollinator attraction will serve as metrics to evaluate these effects. The results of this study will be relevant to a range of crops nationwide for assessment of how land and crop management strategies impact both plant and pollinator health and will open the door to development of potential new strategies for manipulation of soil microbes for promotion of nutritive pollinator forage.

The Safe Urban Harvests Study: An investigation of heavy metals in soils and urban-grown produce in Baltimore, MD

Raychel Santo 2; Carrie Green 3; Eton Codling 3; Keeve Nachman 1, 2, 4. 1 Department of Environmental Health and Engineering, Johns Hopkins School of Public Health; 2 Center for a Livable Future, Johns Hopkins School of Public Health; 3 USDA Agricultural Research Service; 4 Risk Sciences and Public Policy Institute, Johns Hopkins School of Public Health

Background: Urban agriculture (UA) is increasing in popularity due to its numerous sociocultural, health, environmental, and economic benefits, but few groups have evaluated exposure to soil contaminants among urban agriculture participants (UAPs). The community-driven Safe Urban Harvests Study aims to address safety perceptions by characterizing potential exposures to metals (e.g., arsenic, cadmium, chromium, and lead) in soil and urban-grown produce among UAPs in Baltimore, MD.

Methods: We recruited, surveyed, and collected samples of soil from 104 (70% of eligible) farms and community gardens growing food during the 2017 season. At 72 sites, we collected at least one of the thirteen most commonly grown produce items. We measured total metal concentrations in soil and produce using ICP-AES. We investigated correlations between metals concentrations in soil and corresponding produce by calculating Pearson correlation coefficients.

Results: We compared concentrations of metals in soil to several health-based guidelines. Mean lead concentrations in growing area soils were less than the US EPA's residential soil screening level (400pm) at 100 (96%) sites. Measured produce concentrations were compared to concentrations from items measured in those same items purchased from grocery stores and farmers markets in Baltimore. No statistically significant correlations were found between the concentrations of metals in soil and produce.

Discussion: These results are the first to evaluate metal contamination among UA sites in Baltimore to address safety perceptions and will inform specific recommendations for reducing exposure.

Soil Health Benchmark Study

Franklin Egan 1; Sarah Bay Nawa 1. 1PASA.

Farmers need a clear understanding of the status of their soil resources to manage for the future. Since 2016, Pasa has been working through our Soil Health Benchmark Study to document and improve soil health outcomes through farmer-generated data. In 2018, we worked with 34 diversified vegetable farmers, 15 row crop farms, and 8 grazing dairies to quantify soil health using field samples and farm records for practices including cover cropping, soil disturbance, and soil amendments.

Based on the Cornell Comprehensive Assessment of Soil Health, most of our farms showed excellent to optimal organic matter ratings (medians of 95, 96, and 100 on Cornell's 100-point scale for vegetable, row crop, and grazing farms, respectively). Vegetable and row crop farms tended to have low soil protein (medians of 52 and 49, respectively) and microbial respiration (median of 45 and 59, respectively) ratings and poor aggregate stability ratings (median of 27 and 36, respectively). Grazing farms tended to have optimal ratings (scores of 80 and higher) for all of the 12 soil health indicators tested. On vegetable and row crop farms, intensive tillage was often compatible with high organic matter ratings, although aggregate stability ratings were typically lower on farms with intensive tillage.

These data suggest that different farming systems can successfully apply different techniques and strategies to grow soil health. In 2019, we grew our project to 98 participating farms and

partnered with Future Harvest to expand into Maryland. We are currently analyzing soil test and management record data.

Abandon, Restore, Adapt: Farming in the face of sea level rise and saltwater intrusion

Elizabeth de la Reguera 1; Keryn Gedan 2; Kate Tully 1. 1 University of Maryland College Park; 2 George Washington University

As sea levels continue to rise, coastal ecosystems are vulnerable to saltwater intrusion. Saltwater intrusion (SWI) is the landward movement of sea salts that force ecosystem shifts in species composition. Specifically, as soils salinize in coastal farmlands, traditional crops like corn, soy, and wheat can no longer survive. Farmers face a tough decision – try to continue farming as usual, begin farming salt-tolerant crops, or abandon their fields and let nature take over. My objective is to determine the germination rate and survival of crops, weeds, and perennial grasses under saturated soils and different salinity stressors (osmotic and ionic) both in lab and in situ experiments. To investigate plant-salinity interactions, a controlled-environment germination experiment was paired with an experimental field trial on salt-intruded fields on the Lower Eastern Shore, MD. Species include *Zea mays*, salt-tolerant *Glycine max*, *Glycine max*, *Triticum aestivum*, *Hordeum vulgare*, *Sorghum bicolor*, *Brassica napus*, and *Chenopodium quinoa*. We found plant species were able to germinate in higher levels of osmotic stress versus ionic stress, indicating sodium and chloride toxicity has a more negative effect on germinating seeds than the inhibition of water uptake through osmosis. As saltwater intrudes agricultural fields, this research provides much-needed data on which species can survive under flooded and saline conditions across their growth cycle. This research is important to farmers for identifying alternative crops or perennial grasses that meet their agricultural or conservation goals.

Carter Partnership Center



Visit our Exhibitors:

- Delaware State University
- Eastern Shore Land Conservancy
- Fertrell Company
- Full Circle Mushroom Compost LLC
- Future Harvest
- Harry R. Hughes Center for Agroecology
- Kings AgriSeeds
- NRCS
- Northeast SARE
- Purple Mountain Organics
- Seven Springs Farm
- Shaeffer Crop Enhancements
- Shore Rivers
- Sussex Conservation District

Thank you to our Planning Committee:

- Debbie Absher, Sussex Conservation District
- Jayme Arthurs, Delaware NRCS
- Amy Collick, University of Maryland Eastern Shore
- Jason Challandes, Delaware State University
- Sarah Hirsh, University of Maryland Extension
- Brooke Jones, Delaware NRCS
- Jane Lassiter, Virginia NRCS
- Alisha Mulkey, Maryland Department of Agriculture
- Erroll Mattox, University of Maryland Eastern Shore
- Jennifer Nelson, Resource Smart LLC
- Niamh Shortt, Future Harvest
- Jenny Templeton, Virginia NRCS
- Mark VanGessel, University of Delaware



Conference Survey

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