Mid-Atlantic Crop Management School

November 14 – 16, 2023

Princess Royale Oceanfront Resort, Ocean City, MD

About the School

The school offers a 2 ½-day format with a variety of breakout sessions. Individuals needing training in soil and water, nutrient management, crop management and pest management can create their own schedule by choosing from **5** program options offered each hour. Emphasis is placed on new and advanced information with group discussion and interaction encouraged.

Who Should Attend

This school is designed for anyone interested in crop management issues, including:

- agronomists
- crop consultants
- extension educators
- farmers and farm managers
- pesticide dealers, distributors, and applicators
- seed and agrichemical company representatives
- soil conservationists
- state department of agriculture personnel

Continuing Education Credits

The 2023 Mid-Atlantic Crop Management School will offer CCA continuing education units (CEUs) approved by the Certified Crop Adviser Program in the following categories:

- Crop Management
- Pest Management
- Soil & Water Management
- Nutrient Management
- Professional Development
- Sustainability

Total CEUs earned will depend on course selection. This school also provides Pesticide Recertification Credits for DE, MD, NJ, PA, WV, and VA and continuing education for Nutrient Management Consultants in DE, MD, PA, VA, and WV.

Registration Information

The early-bird registration fee (recommended to ensure a place in the sessions of your choice) is **$325** if received by **October 13th**; **$375** if received by **November 6th**. Registration will close on **Monday, November 6th at 11:59 p.m. ET or when enrollment reaches capacity**. Payment of registration fee entitles you to participation in 2½ days of sessions, materials, 3 continental breakfasts, 2 lunches, and refreshment breaks. Eventbrite processing fee will be added to the registration prices listed above.

*****New for 2023: The Mid-Atlantic CCA Board will be hosting an off-site reception on Tuesday November 14th, with transportation and refreshments sponsored by the Board. Please RSVP for the reception when you register for the event as seating at the reception is limited.**

Enrollment is on a first-come, first-served basis.

All registrations must be completed online and be paid by credit card at the time of registration.*

Visit https://bit.ly/MidAtlanticCropSchool to complete your registration online and make your session selections. Once you complete the online registration, you will receive a confirmation email providing verification of your session schedule and receipt of payment.

**If you are unable to provide credit card payment, please contact Ms. Taylor Garrett at tgarret1@umd.edu to discuss alternative payment options.*

Questions about registration or payment should be addressed to Ms. Taylor Garrett at tgarret1@umd.edu or (410) 827-8056.

Cancellation Policy:

- Cancellations must be processed through Eventbrite prior to registration closure on November 6th.
- Any cancellation requests after November 6th can be emailed to tgarret1@umd.edu.

Hotel Reservation Information

The Princess Royale Oceanfront Resort is located at 91st Street in Ocean City, MD. **Contact the hotel directly to make your reservation.**

Call 1-800-4-ROYALE (1-800-476-9253) and identify yourself by group name: MD Crop Management School.

Reserve your room no later than **October 14th, 2023** to guarantee the rates below.

- $109 per night (plus applicable fees & taxes) – Pool view
- $159 per night (plus applicable fees & taxes) – Oceanfront

I. Registration

General registration will begin 8:30 am on November 14. Registration packets and information regarding CEUs and re-certification credits will be available at the registration desk. A continental breakfast will be available. There will be no general session and all breakout sessions begin at 10:00 am on November 14.

II. Crop Management Sessions

Each Session is Worth 1 CEU in Crop Management unless noted.

Biologicals in Crop Production -- During this talk we will cover the use of various biological products in corn, wheat, soybean, and cotton. Current products are marketed with various mechanisms related to the crop's ability to deal with abiotic and biotic stressors during the season. Results from replicated field trials will be presented. *Instructor: Dr. Trenton Roberts, University of Arkansas. Tuesday 10:00am and 11:00am.*

Pushing Yield on Wheat: The key is not going overboard -- Getting 130-150 bushel wheat isn't always about pushing inputs. Often maximizing yield requires pulling back on the range and looking at how we are managing the crop and the inputs. This talk with discuss the management strategies to optimize wheat grain yield, while

maximizing input efficiencies. *Instructor: Dr. Brian Arnall, Oklahoma State University. Tuesday 1:00pm and 2:00pm.*

In-Season Fertilizer Management and After-Market Planter Technologies for Improving Corn Establishment and Yield following a Rye Cover Crop -- Cereal rye (*Secale cereale* L.) cover crop (RCC) use continues to gain popularity due to soil, water quality, and weed control benefits. However, farmers are often hesitant to adopt this practice prior to corn production due to exacerbated stand establishment issues, nutrient deficiencies, and yield losses when following a RCC. The objective of this research was to 1) understand optimum in-season nitrogen (N) fertilizer timings for reducing corn N deficiencies and yield losses when following a RCC and 2) understand the influence of after-market closing wheel types for improving corn emergence and establishment in high-residue RCC systems. Multiple research trials were established across the state of Indiana in both small-plot and field scale no-till/RCC environments to examine the role of multiple in-season N fertilizer application timings (2x2 starter fertilizer + V5, V10 or V5 + V10 sidedress N) for improving corn N uptake and reducing N deficiencies and yield losses following a RCC. In addition, multiple research trials were established to examine the role of after-market closing wheel use designed for high residue/cover crop systems (e.g., Cruiser Xtreme, Copperhead Ag and Cupped Razor, Martin Till) in comparison to standard rubber closing wheels in no-till and RCC environments for improving seed-to-soil contact, furrow residue removal, and corn stand establishment in a RCC system. *Instructor: Dr. Dan Quinn, Purdue University. Tuesday 3:10pm and 4:10pm.*

How Crop Modelling Can Help Make Farming Decisions -- Crop modelling is a tool that has been widely explored in the last decade to understand the physiological basis behind the cropping systems. However, its impact in farming systems has been limited. We will discuss how crop modelling can support farmers in their decision-making process using examples in corn, soybeans, and sorghum. *Instructor: Ms. Ana Carcedo, Kansas State University. Wednesday 8:00am and 9:00am.*

Soybean Management Misconceptions – The soybean crop sensitivity to stress varies across growth stages. This risk can be mitigated through management. This presentation explores common misconceptions with risk and management. *Instructor: Dr. Mark Licht, Iowa State University. Wednesday 10:10am and 11:10am.*

What Can We Learn from Yield Contests? -- Untangling the most relevant factors explaining yields is critical to identify environments and the management practices that increase crop production within them. With this in mind, the Corn and Sorghum yield contest data was employed to provide insights on the major components limiting attainable yields. We will be showcasing the conclusions that can be made from farmers' self-reported data, and the relevance of these assessments to guide future research into practical recommendations. *Instructor: Ms. Ana Carcedo, Kansas State University. Wednesday 1:00pm and 2:00pm.*

Phantom Yield Loss: Myth or Reality -- Whether converting land from conventional to organic grain production would reduce or increase environmental impacts is an open question, especially in the Delmarva region where the majority of conventional grain farmers already employ such conservation practices as no-till or minimum-till soil management, integrated pest management, nutrient management, and cover crops. Given this starting point, we wanted to learn how a switch to organic farming could avoid significant increases in soil disturbance, greater erosion, more runoff, and a deterioration of soil health. *Instructor: Dr. Mark Licht, Iowa State University. Wednesday 3:10pm and 4:10pm.*

Applying Automation Practically At the Farm Level -- As we move into the future we are hearing and seeing more about automation, robotics, and Artificial Intelligence (AI) in Agriculture. We need to understand how we can apply this practically at the farm level to leverage these technologies to be more efficient and profitable. The main goal of this talk is to discuss how automation can be applied at the farm level for our everyday farmer to ensure they are as successful as possible. *Instructor: Dr. Wesley Porter, University of Georgia. Thursday 8:00am and 9:00am.*

Effects of Fertilization Strategy on Triticale Forage Quality and Dairy Cow Performance -- Winter forages can provide environmental benefits through nutrient retention and soil erosion control, but can also be a high yielding and high quality source of forage for livestock. As a result, triticale silage has become a popular forage choice for many dairy producers to increase forage supply. This presentation will discuss some of the best management strategies for maximizing winter forage productivity and will provide preliminary results for a study evaluating the effects of fertilization strategy on triticale forage quality and dairy cow performance. Objectives of the study were 1) to investigate the effect of increasing nitrogen fertility rates with and without sulfur on triticale yield and quality, and 2) to evaluate production implications when incorporating the resulting forage into dairy cow diets. *Instructor: Dr. Amanda Grev, University of Maryland. Thursday 10:10am and 11:10 am.*

III. Nutrient Management Sessions

Each Session is Worth 1 CEU in Nutrient Management

Nutrient Stratification in No-till and its Implication on Management -- Historically tillage homogenized the soil on an annual basis so that the top 6-10 inches of soil was effectively the same. With the implementation of No-till practices, farmers are no longer mixing the soil. This means that surface applied nutrients, specifically immobile nutrients, have increased concentrations in the top 2 inches of the soil. Along with fertilizer, the breakdown of OM on the surface leads to further stratification. This stratification does have an impact on soil sampling and management, this talk will discuss a few key points. *Instructor: Dr. Brian Arnall, Oklahoma State University. Tuesday 10:00am and 11:00am.*

Tissue Testing for Nitrogen and Potassium Management in Corn and Soybean -- Nitrogen fertilization in corn and potassium fertilization in soybean represent the single largest input cost for most producers. Proper management of these nutrients is essential for profitable production. Proactive tissue sampling can provide producers with valuable information to ensure that nutrients are not limiting their yields, but also prevent unnecessary applications that limit profitability. Tissue sampling protocols and proper data interpretation based on crop growth stage will be discussed. *Instructor: Dr. Trenton Roberts, University of Arkansas. Tuesday 1:00pm and 2:00pm.*

Current Status of Carbon Programs for Row Crop Producers – This presentation provides information on the status of carbon markets in the US and the opportunities for row crop producers to enroll in carbon market programs. A high-level overview describes what is a carbon market, current structure of carbon markets, key characteristics, what you can get paid, and FAQs on carbon markets. *Instructor: Dr. Jordan Shockley, University of Kentucky. Tuesday 1:00pm and 2:00pm.*

Taking Credit to Save Money and Benefit the Environment -- Nitrogen management of crops can be very challenging. In this session, we will talk about different nitrogen sources (soil, manure, crop rotations) and discuss different ways of fine-tuning nitrogen management, with specific focus on corn crop rotations. *Instructor: Dr. Quirine Ketterings, Cornell University. Tuesday 3:10pm and 4:10pm.*

Fine-Tuning Nitrogen Management in Corn – Applying the most profitable rate of nitrogen fertilizer is an ongoing challenge for corn production. Optimal rates may vary by field and even by year depending on weather and crop growth conditions. In this session, we will demonstrate a new tool for determining optimal nitrogen fertilizer rate for corn production in Pennsylvania. This tool estimates total nitrogen fertilizer needs ahead of the season based on site-specific information such as soil organic matter and cover crop inputs. We will also discuss

ongoing efforts to inform optimal sidedress nitrogen rate based on early season crop conditions. *Instructor: Dr. Daniela Carrijo, Pennsylvania State University. Wednesday 8:00am and 9:00am.*

Using ManureDB to View Aggregated Manure Nutrient Data -- Livestock and poultry manure can provide valuable nutrients for cropping systems, however overapplication can lead to the risk of nutrient loss to the environment. Planning for appropriate application rates can be complicated as manure nutrients vary greatly based on species, animal nutrition, animal housing, anure storage and handling, animal age, climate, and manure application method. University of Minnesota researchers in the College of Food and Agriculture Natural Resource Sciences, Extension, and the Minnesota Supercomputing Institute, along with the Minnesota Department of Agriculture have publicly released a U.S. manure test database called ManureDB. Sixteen manure testing laboratory partners have submitted over 400,000 manure samples to the ManureDB project, and those numbers continually grow. With manure data from 49 states, spanning over two decades, and a variety of sample details, not only does this new resource improve inputs for nutrient management planning and agricultural modeling, but also allows for other research and analysis. Additional geospatial and statistical features will be added to ManureDB and the data will be eventually annually archived in the National Agricultural Library's Ag Data Commons. *Instructor: Dr. Nancy Bohl Bormann, University of Minnesota. Wednesday 10:10am and 11:10am.*

How Much Phosphorus is Required for Achieving Maximum Corn Grain Yield? Luxury Consumption and Implications for Grain Yield -- While luxury consumption is generally only thought to occur for nitrogen and potassium, previous studies have hinted at the possibility of luxury consumption of phosphorus (P) in corn. Luxury consumption of P in corn was confirmed in a controlled grow-room study that prevented confounding interactions between plants and soil. Corn exhibited a two-step P luxury consumption with respect to both max grain and biomass production; i.e. max grain yield was achieved with total uptake of 580 mg/plant, with further P uptake no longer increasing grain yield but still increasing total biomass until uptake of 730 mg P/plant. Further P uptake occurred after 730 mg/plant, but with no increase in total biomass. Excess P uptake decreased grain yield due to less Cu, Zn, and Fe being translocated from roots to grain, which reduced grain protein content. The P uptake value of 580 mg/plant can be used as a target in developing nutrient uptake models and tools that provide a soil-specific agronomic critical P value. *Instructor: Dr. Chad Penn, USDA-ARS. Wednesday 1:00pm and 2:00pm.*

Foliar Fertilizers for Soybean Production -- This presentation will cover the basics of foliar fertilizers for soybean production, including information about diagnosing nutrient deficiencies, results from recent foliar fertilizer trials, and considerations for making foliar fertilizer applications. *Instructor: Dr. Emma Matchum, University of Florida. Wednesday 3:10pm and 4:10pm.*

Utilizing Cover Crops to Offset Fertilizer Inputs for Corn on Sandy Loam Soils -- On the coastal plain, sandy loam soils are generally prone to subsurface nutrient leaching, such as nitrogen, sulfur, and potassium. Drastic increases in fertilizer prices have severely impacted the profitability of grain production. We will discuss results from our 9-year long-term cover cropping systems study at the Virginia Tech Eastern Shore Agricultural Research and Extension Center which evaluated nutrient cycling through cover crops, impacts on corn yield and soil health, as well as the economics of these diverse cropping systems. *Instructor: Mr. Joseph Haymaker, Virginia Tech. Thursday 8:00am and 9:00am.*

Nitrogen from Cover Crops -- The adoption of cover crops has increased in the Mid-Atlantic region. Understanding decomposition and nitrogen release from cover crops may help us reduce our nitrogen fertilizer application rate. This presentation will layout the cover crop residue breakdown rates and also amount of nitrogen release from different cover crops at different stages of corn growth stages. *Instructor: Dr. Sapana Pokhrel, University of Delaware. Thursday 10:10am and 11:10am.*

I*V. Pest Management Sessions*

Each Session is Worth 1 CEU in Pest Management unless noted.

New Spray Application Methods and Herbicide-Resistant Weed Management -- Unmanned Aerial Systems (UAS) are widely used for mapping and classification of weed species these days. Along with sensing and

collecting image data, a novel idea of pest management through UAS-based site-specific and broadcast pesticide-spray applications has emerged as a potential crop protection tool. Such interventions are necessary for reducing expenses, labor, and chemical load on the agroecosystems and managing pest-resistance issues. UAS-based herbicide applications, spray standardizations, harvest weed seed control strategies, and results of on-going research have shown potential to assist in smart farming. *Instructor: Dr. Vijay Singh, Virginia Tech. Tuesday 1:00pm and 2:00pm.*

Multiple-Resistance in Mid-Atlantic Weeds. What can we do? -- Mid-Atlantic growers continue to struggle with herbicide-resistant weeds. Certain species have recently been confirmed to be resistant to multiple herbicide groups. This presentation will review the resistance mechanisms in these species, provide an overview of research in the region being conducted to help combat these species, and precautions that should be followed to preserve weed control programs. *Instructor: Dr. Kurt Vollmer, University of Maryland. Tuesday 3:10pm and 4:10pm.*

Special Pests in Specialty Crops -- This session will cover recent work and changes with regards to vegetable insect pest management. Discussed pests will focus on cucurbits, sweet corn, and early season processing vegetables. Cucumber beetle and corn earworm insecticide efficacy patterns have changed on Delmarva over the years. Other vegetable pests will be discussed depending on participant interest and time and cover tomato, beans, and fruit and vine crops. *Instructor: Dr. David Owens, University of Delaware. Tuesday 3:10pm and 4:10pm.*

Recent Findings in Soybean Nematode Management in Virginia -- Plant-parasitic nematodes are the most damaging disease pest in Virginia soybeans. Short rotations and fields planted to continuous soybean have resulted in severely damaging populations in some fields. Nematode-resistant varieties provide the best solution to reducing nematode damage but many field populations of SCN (soybean cyst nematode) that have overcome the most common source of SCN resistance (R3 conferred by PI 88788). Soybeans with the Peking source of SCN still consistently perform well in fields where SCN populations have a high frequency of races that have overcome R3 resistance. Soybean resistance to RKN (root-knot nematode) is very effective in fields with damaging levels. Seed treatment and in-furrow nematicide options have shown to be very inconsistent for season-long management of nematodes in soybeans. Results from field trials along with nematode control measures will be presented. *Instructor: Dr. David Langston, Virginia Tech. Wednesday 8:00am and 9:00am.*

Endangered Species Act: Potential Label Changes -- The Endangered Species Act (ESA) was enacted in 1973 and requires all Federal Agencies to consider the impacts of their decisions on threatened and endangered species and their critical habitat. The ESA only considers impacts to listed species it does not consider impacts to growers. In 2023 the EPA, Office of Pesticide Programs said it would consider the impacts on listed species from all new pesticide registrations and future pesticide re-registration. Considering impacts on endangered and threatened species will have a large impact because there are over 1,800 of these species which occur in all 50 states, U.S. territories, and the District of Columbia. To reduce offsite movement new pesticide labels will include requirements regarding: soil moisture, infield buffers, and conservation practices. *Instructor: Dr. Bill Chism, US-EPA (retired). Wednesday 10:10am and 11:10am.*

Crash Course on Corn Disease Identification -- Diagnosis is a critical step for making effective disease management decisions, but correct identification can be difficult. In this session we will build skills for improved diagnosis and rating of diseases in corn. Live plant samples and preserved specimens will be used for hand-on disease identification training and interactive disease ratings. This session will also introduce regional diagnostic resources and discuss disease management strategies. *Instructors: Dr. Alyssa Koehler, Dr. Isabel Emanuel, and Ms. Maddle Henrickson, University of Delaware. Wednesday 3:10pm and 4:10pm.*

Pros and Cons of Grain Insect Pest Management Options -- Seed treatment and plant incorporated Bt trait selection occurs when seed is purchased, setting the stage for season-long insect management. This talk will discuss the pros and cons of these products, in-season foliar insecticide options, and recent insect pest management research results. *Instructor: Dr. Kelly Hamby, University of Maryland. Thursday 8:00am and 9:00am.*

V. Soil and Water Sessions

Each Session is Worth 1 CEU in Soil and Water Management

Connecting Soil Health to Nutrient Management Decisions -- Soil health/biological processes play a role in nutrient cycling, which affects soil fertility tests. However, there is little research relating soil health/biological measurements to crop yield or fertilization recommendations. Therefore, there is potential for improving the accuracy of fertilizer rate recommendations by including soil health/biological test results with traditionally used soil fertility tests. Research was conducted in 101 Missouri fields and 43 sites in South Dakota from 2019-2022 to determine what soil health tests could be used to improve corn phosphorus, potassium, and nitrogen recommendations. During the presentation we will discuss what soil health tests and other basic soil tests can be used to improve phosphorus, potassium, and nitrogen fertilizer recommendations in corn. For example, for phosphorus including soil respiration, cation exchange capacity, and clay % improved corn response prediction accuracy by 6% and for potassium including cation exchange capacity, soil organic matter, and permanganate oxidizable carbon improved corn response prediction accuracy by 10%. Additionally, we will discuss the soil measurements that have the best relationship with corn nitrogen fertilizer recommendations. *Instructor: Dr. Jason Clark, South Dakota State University. Tuesday 10:00am and 11:00am.*

Urban Agriculture and Conservation - Urban Agriculture is a strategy used by communities to address food security, climate-change, storm-water management, economic and career development, social and environmental justice, and overall resilience. Learn how agricultural service providers from Maryland promote and support urban agriculture and conservation in Baltimore, Prince George's County, and Washington DC. This session will review common soil and water resource concerns found on urban farms as well as infrastructure challenges. Instructors will provide case studies and examples of strategies used by urban farms to address these resource concerns and challenges, as well as resources to support and fund their successful implementation. Finally, hear how local policy and programs can both support and hinder the success of urban farms, as well as their capacity to incorporate conservation measures and effectively serve their communities. *Instructors: Dr. Collene Kiefer, USDA NRCS, Ms. Kim Rush Lynch, Prince George's County Soil Conservation District, and Ms. Alison Worman, Farm Alliance of Baltimore. Tuesday 1:00pm and 2:00pm.*

Thinking of $15 Corn and $30 Soybeans but Worried About Losing Soil Heath and Maybe Your Shirt During the Organic Transition? -- The demand for organic grain has outstripped domestic supplies, and large amounts are being imported both as human food and animal feed. Maryland has a large poultry production industry that is ramping up organic poultry production and needs more organically certified grains. These trends have led to consistently attractive prices for organic corn and soybeans. But transitioning to organic grain production is no easy feat. The challenging 3-year process requires using 100% organic approved practices but most likely getting only conventional prices. The learning curve may involve navigating unfamiliar management practices, equipment, allowable chemicals, and markets - not to mention the soil health and financial implications. Join me to learn about our 4-years of research trials (and tribulations) testing different management strategies for the transition period. This session will discuss what we learned to do (and not do) as we attempted to find the Goldilocks strategy of crop, tillage, and cover crops that would best promote both soil health and profits. *Instructor: Dr. Ray Weil, University of Maryland. Wednesday 8:00am and 9:00am.*

Agricultural Strategies for Mitigating and Adapting to Saltwater Intrusion -- This presentation will highlight some appropriate conservation practices and field management strategies to help mitigate the impacts of coastal flooding and saltwater intrusion on working lands. *Instructor: Dr. Christopher Miller, USDA NRCS. Wednesday 10:10am and 11:10am.*

Adaptation of Pasture and Hayland Species for Mechanical and Simulated Ruminant Harvest in Appalachia -- In the Appalachian region, overgrazing is a common occurrence, due to continuous grazing and overstocking, leading to increased soil erosion, limited forage availability, decreased animal performance, animal health issues, and water quality and soil health degradation. This talk will summarize a study designed to demonstrate the effects of overgrazing and limited soil nutrient availability on forage species longevity, composition, and production. Through the completion of the study, the presence of adaptive species in certain regions has provided not only ground cover in critical intense rainfall periods but also fills a forage gap that

may otherwise be void. These forage species may also prove useful in other parts of the Mid-Atlantic region to address water and forage quality on a much broader scale. *Instructor: Mr. Isaac Wolford, USDA NRCS. Wednesday 1:00pm and 2:00pm.*

Sustainable Intensification of Agricultural Drainage Systems -- Drainage is essential for agricultural production. Sustainable intensification of agricultural drainage is needed to meet production, environmental, and greenhouse gas goals. This will entail re-designing drainage systems to handle larger precipitation events, manage water through droughts, and reduce nutrient losses. Conservation drainage covers a suite of practices that help achieve these goals and are being implemented throughout the Delmarva. This presentation will go over sustainable intensification of agricultural drainage systems and basic research being conducted on performance of these systems to enhance nutrient use efficiency and improve water quality. *Instructor: Mr. Timothy Rosen, ShoreRivers. Wednesday 1:00pm and 2:00pm.*

Grow Your Stewardship -- Join the USDA's Natural Resources Conservation Service to learn about the additional funding opportunities available to producers and opportunities for Technical Service Providers (TSPs) through the historic, once-in-a-generation Inflation Reduction Act (IRA), and how conserving, maintaining, and restoring our natural resources can improve both the health and wealth of agricultural operations in the future. *Instructor: USDA NRCS Staff. Wednesday 3:10pm and 4:10pm.*

Beyond the Ditches: Ten More Years of Research on P Removal Structures - Excessive losses of dissolved phosphorus (P) from high P soils to surface waters can occur for decades, even after P application has ceased and traditional conservation practices have been implemented. For this reason, P removal structures were developed to intercept and filter dissolved P until soil test P levels are drawn down to safe levels via crop removal. Fifteen years ago, the initial research was conducted by constructing "ditch filters" on the Eastern Shore. While effective, major advancements have been made since that time, including design, more economical and efficient filter media, software for fast and easy site-specific design (P-Trap), and training videos on all aspects from choosing a site to construction tips. This presentation will summarize advancements and current recommendations, discuss how blind inlets can be designed to additionally serve as a P removal structures, and provide a brief demonstration of the P-Trap software**.** *Instructor: Dr. Chad Penn, USDA ARS. Thursday 8:00am and 9:00am.*

Understanding Soil Moisture Sensors and Irrigation Scheduling -- While they are one of the most accurate ways of scheduling irrigation, soil moisture sensors are often one of the lowest methods of irrigation scheduling. There are many reasons behind low adoption, some include cost, complexity of the systems, how to make decisions from the data and reliability of systems. The main goal of this talk is to educate producers on how to better interpret data, the benefits of using sensors, and some economic advantages of using sensors compared to other methods. While there are other valid methods available, producers should consider some sort of advanced irrigation scheduling beyond checkbook, calendar and visual scheduling, and ideally this talk will help them feel more comfortable in doing that. *Instructor: Dr. Wesley Porter, University of Georgia. Thursday 10:10am and 11:10am.*

VI. Alternative Session

CEUs for each session are provided after the abstract

Air Quality, Right-to-Farm, and Californians: 2023 Court Decisions and Implications on Nutrient Management -- CAFO permit decision for MD involving air quality, a Talbot County right-to-farm decision, and the Prop 12 decision (California standards for how pork, veal, and eggs would be produced to be sold in CA) have possible implications to Mid-Atlantic agriculture. The implications of all those decisions will potentially impact nutrient management in MD and the region. *Instructor: Mr. Paul Goeringer, University of Maryland. Tuesday 10:00am and 11:00am. (1 CEU in Nutrient Management)*

How Plants Cultivate Soil Microbes to Obtain Nutrients -- This presentation will discuss how plants use soil microbes and endophytes to obtain nutrients in the rhizophagy cycle. The roles of root hairs, trichomes and other plant structures in nitrogen acquisition will also be covered. *Instructor: Dr. James White, Rutgers University. Wednesday 8:00am and 9:00am. (1 CEU in Nutrient Management)*

Research and Recommendations on Blueberry and Bramble Establishment -- Blueberries, blackberries and raspberries can be profitable crops in the Mid-Atlantic region, but successful establishment is key to achieving good yield and quality early in the life of the planting. Recommended establishment practices for each of these crops will be discussed, including soil preparation, mulching, trellis options, irrigation, fertilization and establishment pruning. Variety selection is another important decision made at establishment; results from blueberry and bramble variety evaluations conducted in Delaware and regionally will be presented. *Instructor: Ms. Emmalea Ernest, University of Delaware. Wednesday 10:10am and 11:10am. (1 CEU in Crop Management)*

Strawberries at the USDA in Beltsville: New Cultivars, Diseases, Practices, and Perspectives -- For over 100 years, the USDA-ARS strawberry breeding program in Beltsville, MD, has made major contributions to the development of the strawberry as a crop. Emphasis has long been on natural disease resistance and flavor. Recent cultivars include Flavorfest (mid-season), Keepsake (mid-season to late mid-season), Cordial (late-season) and a new early season cultivar to be released and named very soon. Emerging diseases have affected the breeding fields since 2020, identifying selections that are either resistant or carry genes for resistance. Small hand-held tools for evaluating flavor have been compared for reliability and ease of use. Fruit qualities key to perception of freshness have been identified during post-harvest evaluation. Field management protocols have been adjusted to accommodate reduced staff. Our experiences and findings will be shared for discussion. *Instructor: Dr. Kim Lewers, USDA ARS. Wednesday 1:00pm and 2:00pm. (1 CEU in Pest Management)*

Spotted Wing Drosophila IPM Best Practices and Updates -- Quick to reproduce and tricky to manage, spotted wing drosophila is the key insect pest of U.S. small fruit production. This presentation will highlight management lessons learned from over a decade of research globally as well as ongoing advancements with the potential to help Mid-Atlantic producers. *Instructor: Dr. Kelly Hamby, University of Maryland. Wednesday 3:10pm and 4:10pm. (1 CEU in Pest Management)*

Turfgrass Breeding Revolution - Why Cultivar Selection Matters -- Turfgrass cultivar selection prior to establishment is often overlooked or viewed as less important when compared to other management issues such as fertility and irrigation. With giant leaps being made in the turfgrass breeding industry, proper cultivar selection is even more critical to ensure long-term viability of a sward. We will cover the current revolution in breeding, how cultivars are selected and evaluated, and how to make sound cultivar selection choices based on the data from the NTEP (National Turfgrass Evaluation Program) trials. *Instructor: Mr. John Emerson, University of Delaware. Thursday 8:00am and 9:00am. (1 CEU in Crop Management)*

Advancing Cover Cropping to a Purpose-driven, Site-specific Model -- Cover crops can fit and be beneficial in diverse types of cropping systems and enterprises. Strategic cover crop planning can increase the agronomic, economic, and environmental benefits achieved through cover cropping. This session will discuss strategies and tools for farmers to identify the top needs of the cropland that can be addressed through cover cropping, identify and potentially create gaps in the cash crop rotations to fit cover crops, and critically evaluate the limitations of cover crops. Farmers can then evaluate and plan cover crop species and management that will provide the most benefits while also fitting within the farmer's limitations. *Instructor: Dr. Sarah Hirsh, University of Maryland. Thursday 10:10am and 11:10am. (1 CEU in Crop Management)*

VI. Specialty Certifications

CEUs for each session are provided after the abstract. Note: specialty credits count toward the overall CEU requirement for all CCA, regardless of if the individual holds a specialty certification.

How Corporate Sustainability Pledges Influence Farm Management Practices – Are we moving towards more contract production, focused on sustainability, in the grain and oilseed sectors? This presentation will outline what is a sustainability pledge, or ESG pledge, and how meeting the goals of such pledges could impact management practices on the farm. Various agribusiness corporate pledges will be presented along with concerns from an economist's perspective. Awareness of the impact corporate pledges can have on farm level

management practices is critical for risk management in the future. *Instructor: Dr. Jordan Shockley, University of Kentucky. Tuesday 10:00am and 11:00am. (1 CEU in Sustainability)*

So You Want to Write Nutrient Management Plans Privately? What Do You Need To Know – For those considering writing nutrient management programs for a fee, this session will cover the ends and outs of what you should think about to set your business up in a way to manage risks. *Instructor: Mr. Paul Goeringer, University of Maryland. Tuesday 3:10pm and 4:10pm. (1 CEU in Professional Development)*

Maryland Nutrient Management - Moving the Program Forward in 2023 and Beyond – The MDA Nutrient Management Program will update and explain efforts being taken to improve the delivery of quality, efficient and effective nutrient management planning in the state. Discussion will include the current situation and availability of NM Plan writers both at UME and private, and a review of the issues being addressed by the Department and the NM Advisory Committee. Other issues to be presented include efforts to revise or replace the NuMan planning software, the need for the latest technology to be integrated into the planning process, enhanced nutrient management opportunities, and alternatives to traditional nutrient management planning to meet individual needs of progressive farm operators. An update will be given on the efforts of the newly appointed Farmer Task Force and feedback will be accepted from Crop School attendees. Conference attendees are strongly encouraged to come prepared with comments and suggestions that can be taken back to the Department and the Advisory Committee. *Instructor: Mr. Dwight Dotterer, Maryland Department of Agriculture. Thursday 10:10am and 11:10am. (1 CEU in Professional Development)*

2023 Crop Management School Workshop Schedule

Tuesday, November 14, 2023

Time	Palmetto 2 & 3 (upstairs)	Palmetto 4 & 5 (upstairs)	Barbados & Cayman (downstairs)	Dominica & Eleuthera (downstairs)	Palmetto 1 (upstairs)
Session	**Crop Management**	**Nutrient Management**	**Sustainability**	**Soil & Water**	**Nutrient Management**
10:00 - 10:50	Biologicals in Crop Production *Dr. Trenton Roberts*	Nutrient Stratification in No-till and its Implication on Management *Dr. Brian Arnall*	How Corporate Sustainability Pledges Influence Farm Management Practices *Dr. Jordan Shockley*	Connecting Soil Health to Nutrient Management Decisions *Dr. Jason Clark*	Air Quality, Right-to-Farm, and Californians: 2023 Court Decisions and Implications on Nutrient Management *Mr. Paul Goeringer*
11:00 - 11:50	Biologicals in Crop Production *Dr. Trenton Roberts*	Nutrient Stratification in No-till and its Implication on Management *Dr. Brian Arnall*	How Corporate Sustainability Pledges Influence Farm Management Practices *Dr. Jordan Shockley*	Connecting Soil Health to Nutrient Management Decisions *Dr. Jason Clark*	Air Quality, Right-to-Farm, and Californians: 2023 Court Decisions and Implications on Nutrient Management *Mr. Paul Goeringer*
11:50 - 1:00	**LUNCH BREAK**				
Session	**Crop Management**	**Nutrient Management**	**Pest Management**	**Soil & Water**	**Nutrient Management**
1:00 - 1:50	Pushing Yield on Wheat: The key is not going overboard *Dr. Brian Arnall*	Tissue Testing for Nitrogen and Potassium Management in Corn and Soybean *Dr. Trenton Roberts*	New Spray Application Methods and Herbicide-Resistant Weed Management *Dr. Vijay Singh*	Urban Agriculture and Conservation *Dr. Colleen Kiefer and Ms. Kim Rush Lynch*	Current Status of Carbon Programs for Row Crop Producers *Dr. Jordan Shockley*

2023 Crop Management School Workshop Schedule

2:00 - 2:50	Pushing Yield on Wheat: The key is not going overboard *Dr. Brian Arnall*	Tissue Testing for Nitrogen and Potassium Management in Corn and Soybean *Dr. Trenton Roberts*	New Spray Application Methods and Herbicide-Resistant Weed Management *Dr. Vijay Singh*	Urban Agriculture and Conservation *Dr. Colleen Kiefer and Ms. Kim Rush Lynch*	Current Status of Carbon Programs for Row Crop Producers *Dr. Jordan Shockley*

Tuesday, November 14, 2023 (continued)

Time	Palmetto 2 & 3 (upstairs)	Palmetto 4 & 5 (upstairs)	Barbados & Cayman (downstairs)	Dominica & Eleuthera (downstairs)	Palmetto 1 (upstairs)
2:50 - 3:10	**BREAK**				
Session	**Crop Management**	**Nutrient Management**	**Pest Management**	**Pest Management**	**Professional Development**
3:10 - 4:00	In-Season Fertilizer Management and After-Market Planter Technologies for Improving Corn Establishment and Yield following a Rye Cover Crop *Dr. Dan Quinn*	Taking Credit to Save Money and Benefit the Environment *Dr. Quirine Ketterings*	Multiple-Resistance in Mid-Atlantic Weeds. What can we do? *Dr. Kurt Vollmer*	Special Pests in Specialty Crops *Dr. David Owens*	So You Want to Write Nutrient Management Plans Privately? What Do You Need To Know *Mr. Paul Goeringer*
4:10 - 5:00	In-Season Fertilizer Management and After-Market Planter Technologies for Improving Corn Establishment and Yield following a Rye Cover Crop *Dr. Dan Quinn*	Taking Credit to Save Money and Benefit the Environment *Dr. Quirine Ketterings*	Multiple-Resistance in Mid-Atlantic Weeds. What can we do? *Dr. Kurt Vollmer*	Special Pests in Specialty Crops *Dr. David Owens*	So You Want to Write Nutrient Management Plans Privately? What Do You Need To Know *Mr. Paul Goeringer*

2023 Crop Management School Workshop Schedule

Wednesday, November 15, 2023

Time	Palmetto 2 & 3 (upstairs)	Palmetto 4 & 5 (upstairs)	Barbados & Cayman (downstairs)	Dominica & Eleuthera (downstairs)	Palmetto 1 (upstairs)
Session	**Crop Management**	**Nutrient Management**	**Pest Management**	**Soil & Water**	**Nutrient Management**
8:00 - 8:50	How Crop Modelling Can Help Make Farming Decisions *Ms. Ana Carcedo*	Fine-Tuning Nitrogen Management in Corn *Dr. Daniela Carrijo*	Recent Findings in Soybean Nematode Management in Virginia *Dr. David Langston*	Thinking of $15 Corn and $30 Soybeans but Worried About Losing Soil Heath and Maybe Your Shirt During the Organic Transition? *Dr. Ray Weil*	How Plants Cultivate Soil Microbes to Obtain Nutrients *Dr. James White*
9:00 - 9:50	How Crop Modelling Can Help Make Farming Decisions *Ms. Ana Carcedo*	Fine-Tuning Nitrogen Management in Corn *Dr. Daniela Carrijo*	Recent Findings in Soybean Nematode Management in Virginia *Dr. David Langston*	Thinking of $15 Corn and $30 Soybeans but Worried About Losing Soil Heath and Maybe Your Shirt During the Organic Transition? *Dr. Ray Weil*	How Plants Cultivate Soil Microbes to Obtain Nutrients *Dr. James White*
9:50 - 10:10	**BREAK**				
Session	**Crop Management**	**Nutrient Management**	**Pest Management**	**Soil & Water**	**Crop Management**
10:10 - 11:00	Soybean Management Misconceptions *Dr. Mark Licht*	Using ManureDB to View Aggregated Manure Nutrient Data *Dr. Nancy Bohl Bormann*	Endangered Species Act: Potential Label Changes *Dr. Bill Chism*	Agricultural Strategies for Mitigating and Adapting to Saltwater Intrusion *Mr. Christopher Miller*	Research and Recommendations on Blueberry and Bramble Establishment *Ms. Emmalea Ernest*
11:10 - 12:00	Soybean Management Misconceptions *Dr. Mark Licht*	Using ManureDB to View Aggregated Manure Nutrient Data *Dr. Nancy Bohl Bormann*	Endangered Species Act: Potential Label Changes *Dr. Bill Chism*	Agricultural Strategies for Mitigating and Adapting to Saltwater Intrusion *Mr. Christopher Miller*	Research and Recommendations on Blueberry and Bramble Establishment *Ms. Emmalea Ernest*
12:00 - 1:00	**LUNCH BREAK**				

2023 Crop Management School Workshop Schedule

Wednesday, November 15, 2023 (continued)

Time	Palmetto 2 & 3 (upstairs)	Palmetto 4 & 5 (upstairs)	Barbados & Cayman (downstairs)	Dominica & Eleuthera (downstairs)	Palmetto 1 (upstairs)
Session	**Crop Management**	**Nutrient Management**	**Soil & Water**	**Soil & Water**	**Pest Management**
1:00 - 1:50	What Can We Learn from Yield Contests? *Ms. Ana Carcedo*	How Much Phosphorus is Required for Achieving Maximum Corn Grain Yield? Luxury Consumption and Implications for Grain Yield *Dr. Chad Penn*	Adaptation of Pasture and Hayland Species for Mechanical and Simulated Ruminant Harvest in Appalachia *Mr. Isaac Wolford*	Sustainable Intensification of Agricultural Drainage Systems *Mr. Tim Rosen*	Strawberries at the USDA in Beltsville: New Cultivars, Diseases, Practices, and Perspectives *Dr. Kim Lewers*
2:00 - 2:50	What Can We Learn from Yield Contests? *Ms. Ana Carcedo*	How Much Phosphorus is Required for Achieving Maximum Corn Grain Yield? Luxury Consumption and Implications for Grain Yield *Dr. Chad Penn*	Adaptation of Pasture and Hayland Species for Mechanical and Simulated Ruminant Harvest in Appalachia *Mr. Isaac Wolford*	Sustainable Intensification of Agricultural Drainage Systems *Mr. Tim Rosen*	Strawberries at the USDA in Beltsville: New Cultivars, Diseases, Practices, and Perspectives *Dr. Kim Lewers*
2:50-3:10	**BREAK**				
Session	**Crop Management**	**Nutrient Management**	**Pest Management**	**Soil & Water**	**Pest Management**
3:10 - 4:00	Phantom Yield Loss: Myth or Reality *Dr. Mark Licht*	Foliar Fertilizers for Soybean Production *Dr. Emma Matchum*	Crash Course on Corn Disease Identification *Dr. Alyssa Koehler, Dr. Isabel Emanuel, and Ms. Maddle Henrickson*	Grow Your Stewardship *USDA-NRCS Staff*	Spotted Wing Drosophila IPM Best Practices and Updates *Dr. Kelly Hamby*
4:10 - 5:00	Phantom Yield Loss: Myth or Reality *Dr. Mark Licht*	Foliar Fertilizers for Soybean Production *Dr. Emma Matchum*	Crash Course on Corn Disease Identification *Dr. Alyssa Koehler, Dr. Isabel Emanuel, and Ms. Maddle Henrickson*	Grow Your Stewardship *USDA-NRCS Staff*	Spotted Wing Drosophila IPM Best Practices and Updates *Dr. Kelly Hamby*

2023 Crop Management School Workshop Schedule

Thursday, November 16, 2023

Time	Palmetto 2 & 3 (upstairs)	Palmetto 4 & 5 (upstairs)	Barbados & Cayman (downstairs)	Dominica & Eleuthera (downstairs)	Palmetto 1 (upstairs)
Session	**Crop Management**	**Nutrient Management**	**Pest Management**	**Soil & Water**	**Crop Management**
8:00 - 8:50	Applying Automation Practically At the Farm Level *Dr. Wesley Porter*	Utilizing Cover Crops to Offset Fertilizer Inputs for Corn on Sandy Loam Soils *Mr. Joseph Haymaker*	Pros and Cons of Grain Insect Pest Management Options *Dr. Kelly Hamby*	Beyond the Ditches: Ten More Years of Research on P Removal Structures *Dr. Chad Penn*	Turfgrass Breeding Revolution - Why Cultivar Selection Matters *Mr. John Emerson*
9:00 - 9:50	Applying Automation Practically At the Farm Level *Dr. Wesley Porter*	Utilizing Cover Crops to Offset Fertilizer Inputs for Corn on Sandy Loam Soils *Mr. Joseph Haymaker*	Pros and Cons of Grain Insect Pest Management Options *Dr. Kelly Hamby*	Beyond the Ditches: Ten More Years of Research on P Removal Structures *Dr. Chad Penn*	Turfgrass Breeding Revolution - Why Cultivar Selection Matters *Mr. John Emerson*
9:50-10:10	**BREAK**				
Session	**Crop Management**	**Nutrient Management**	**Professional Develop.**	**Soil & Water**	**Crop Management**
10:10 - 11:00	Effects of Fertilization Strategy on Triticale Forage Quality and Dairy Cow Performance *Dr. Amanda Grev*	Nitrogen from Cover Crops *Dr. Sapana Pokhrel*	Maryland Nutrient Management - Moving the Program Forward in 2023 and Beyond *Mr. Dwight Dotterer*	Understanding Soil Moisture Sensors and Irrigation Scheduling *Dr. Wesley Porter*	Advancing Cover Cropping to a Purpose-driven, Site-specific Model *Dr. Sarah Hirsh*
11:10 - 12:00	Effects of Fertilization Strategy on Triticale Forage Quality and Dairy Cow Performance *Dr. Amanda Grev*	Nitrogen from Cover Crops *Dr. Sapana Pokhrel*	Maryland Nutrient Management - Moving the Program Forward in 2023 and Beyond *Mr. Dwight Dotterer*	Understanding Soil Moisture Sensors and Irrigation Scheduling *Dr. Wesley Porter*	Advancing Cover Cropping to a Purpose-driven, Site-specific Model *Dr. Sarah Hirsh*

2023 Planning Committee

Executive Committee

Dr. Nicole Fiorellino – University of Maryland
Dr. Jarrod Miller – University of Delaware
Dr. Amy Shober – University of Delaware

CEU Coordinator

Ms. Sydney Riggi – University of Delaware
Ms. Hilary Gibson – University of Delaware

Evaluation Coordinator

Ms. Jennifer Volk – University of Delaware

On-Site Facilities Coordinator

Mr. Joe Hatton – West Virginia Department of Agriculture

Program Teams

Crop Management

Dr. Nicole Fiorellino (Leader)– University of Maryland
Dr. Sarah Hirsh – University of Maryland
Dr. Jarrod Miller – University of Delaware
Mr. Mark Townsend – University of Maryland

Nutrient Management

Dr. Mark Reiter (Leader) – Virginia Tech
Dr. Amy Shober – University of Delaware
Ms. Maegan Perdue – University of Maryland

Pest Management

Dr. David Owens (Leader) – University of Delaware
Dr. Alyssa Koehler – University of Delaware
Dr. Mark VanGessel – University of Delaware
Ms. Emily Zobel – University of Maryland

Soil and Water Management

Dr. Annie Rossi-Gill (Leader) – USDA-NRCS
Ms. Jennifer Volk – University of Delaware
Ms. Hilary Gibson – University of Delaware
Mr. Isaac Wolford – USDA NRCS
Dr. Dana Rushovich – USDA-NRCS

Alternative Session

Mr. Andrew Kness (Leader) – University of Maryland
Ms. Erika Crowl – University of Maryland

The Mid-Atlantic Crop Management School is sponsored by the University of Delaware Cooperative Extension and University of Maryland Extension, in conjunction with the Mid-Atlantic Certified Crop Advisor (CCA) Board, and the United States Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS).

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