

Announcing the
22nd Annual



Mid-Atlantic Crop Management School

November 15-17, 2016

Princess Royale Hotel and Conference Center, 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 agricultural company representatives
- soil conservationists
- state department of agriculture personnel

Continuing Education Credits

The 2016 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
Nutrient Management
Pest Management
Professional Development
Soil & Water Management

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, VA, and WV.

Registration Information

The early-bird registration fee (recommended to ensure a place in the sessions of your choice) is **\$275** if received by **October 30**. After that date the fee will be **\$325**, and must be received by **November 4**. Payment of registration fee entitles you to participation in 2 ½ days of sessions, materials, 3 continental breakfasts, 2 lunches, and refreshment breaks.

Enrollment is on a first-come, first-served bases. Breakout sessions will be limited to 90 participants in each session with the exception of the climate session and the Crop School on Wheels, which have attendee limitations.

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

Visit

https://cravola.hcs.udel.edu/conf/registration/crop_mangement 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 and wish to pay by check, complete the online registration and select the alternative payment option listed. Please note that your selected sessions can only be guaranteed once full payment has been processed.*

Questions about registration or payment should be addressed to Conference Services: Attn. Gail Knapp, 104 John M. Clayton Hall, Newark, DE 19716, email G_Knapp@facilities.udel.edu or call Gail at 302-831-2998.

Cancellation Policy:

- All cancellations must be submitted in writing via email to G_Knapp@facilities.udel.edu
- Cancellation requests received on or before 5:00 pm November 4 are fully refundable, less a processing fee of \$25.00.
- No refunds after November 4.
- Substitutions are allowed at no additional cost provided notification is sent to Gail Knapp or Amy Shober prior to the event start date.

Hotel Reservation Information

The Princess Royale Oceanfront Hotel and Conference Center is located at 91st Street in Ocean City, MD.

Please contact the hotel directly to make your reservation. **Call 1-800-4-ROYALE or 410-524-7777 and identify yourself as a Crop Management School participant. Reserve your room no later than October 7 to guarantee the rates below.**

\$69 per night (plus applicable taxes) – Ocean/Poolview
\$90 per night (plus applicable taxes) – Oceanfront Suite

I. Registration

General registration will begin 8:30 a.m. on November 15. 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 a.m. on November 15.

II. Crop Management Sessions

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

Meeting the Demand for Quality Soft Red Winter Wheat: What Growers Should Know -- Recently, both local and international buyers of wheat have modified the quality standards of Soft Red Winter Wheat (SRWW). In order to obtain wheat with these new standards, payment schedules have been changed. In this session you will learn 1) the factors that define SRWW quality for bakers, millers, elevators, and farmers; 2) the environmental and genetic factors that affect SRWW quality; and 3) how growers can attain the quality characteristics most important to their bottom line. *Instructor: Dr. Bob Kratochvil, University of Maryland College Park. Tuesday 10:00 and 11:00 am*

How to Increase Chances of Having a Successful On-Farm Trial: Part 1 -- On-farm trials can be an informational resource to growers and agri-businesses alike. Successful on-farm projects entail more than just correct design and collecting yield data. This first session will cover the basic fundamentals of on-farm research such as design, plot layout, measurements, equipment, randomization, replication, and data analysis. *Instructor: Mr. Josh Sievers, Iowa State University. Tuesday 1:00 and 2:00pm*

Soybean Nutrient Needs: These Aren't Your Grandpa's Varieties -- We have evaluated soybeans from the 1920s to 2010's as they respond to management such as planting dates, seed rates, nitrogen supply, and disease control. Our latest investigations document the changes in nutrient uptake across the growing season from these varieties, especially as it relates to varieties of the last 50 years. The vast majority of soybean fertility work was done over 40 years ago, and the modern varieties are behaving differently from

nutrient uptake to plant development. We are now exploring these changes in plant physiology as it will likely effect our methods of management (including fertility, disease, and insect). *Instructor: Dr. Shaun Casteel, Purdue University. Tuesday 3:10 and 4:10pm*

How to Increase Chances of Having a Successful On-Farm Trial: Part 2 -- In this second session, we will share successes, challenges, and experiences of 11 years of doing on-farm trials in Iowa. We will cover tools that I have found useful to help lead to successful results. In addition, we will share some of the practices that farmers have implemented from the results of our research. *Instructor: Mr. Josh Sievers, Iowa State University. Wednesday 8:00 and 9:00am*

Precision Agriculture Update -- This session will focus on today's precision agriculture trends in hardware, software, and data management. This is an interactive session so be prepared to ask questions, provide comments, and join in on the discussion. *Instructor: Mr. Dave Wharry, Hooper, Inc. Wednesday 10:10 and 11:10am*

Breaking Bean Barriers: The Next Generation -- We will discuss the steps in breaking the bean barrier now and into the future. Intensive management trials of soybean across the Midwestern US have investigated individual inputs to management combinations over the past few years. The trials evaluated seed treatments to foliar applications of biologicals, pesticides, and fertilizers crossed with other management decisions – varieties, seed rates, row spacing, and planting dates. *Instructor: Dr. Shaun Casteel, Purdue University. Wednesday 1:00 and 2:00pm*

Big Data and Implications at the Farm -- Prescriptive Agriculture is growing here in the US with several companies and retailers providing these data tools as a means to improve input efficiency at the farm level. At the same time, Big Data in agriculture production continues to be a topic of attention both positive and negatively. This presentation to overview Big Data and how it is evolving within US agriculture and the potential benefits it can provide farmers. *Instructor: Dr. John Fulton, Ohio State University. Wednesday 3:10 and 4:10pm*

Generating Useful Data with Precision Ag Technology -- Prescription and data service offerings continue to grow with many services requiring farmers to provide precision ag data in order to receive recommendations and other valuable information. In order for a farmer to take full advantage, capturing data from machinery is essential to provide valuable feedback while data quality remains important since poor quality data can lead to incorrect decisions. Today, equipment and technology has the ability to collect machine, agronomic, and production data, providing insights to

the farm operation. This presentation will discuss the variety of data layers that are available to farmers at the field level while touching on quality issues with data layers such as as-planted and yield maps. Examples of merging agronomic and machine data will be presented outlining how they can improve on-farm evaluations. *Instructor: Dr. John Fulton, Ohio State University. Thursday 8:00 and 9:10am*

Closing the Yield Gap between Double Crop and Full Season Soybeans -- Double-crop soybean yield less than full-season soybean primarily due to less time to develop adequate leaf area that captures 90 to 95% of sunlight by early pod development stages. This can be partially alleviated with early planting, narrow rows, higher seeding rates, and planting later relative maturities. However, other factors, ranging from soil fertility and nutrients to pest management, also disproportionately and negatively impact double-crop yields. This presentation will summarize past and ongoing research looking at closing the yield gap between double-crop and full-season soybean. *Instructor: Dr. David Holshouser, Virginia Tech. Thursday 10:10 and 11:10am*

III. Nutrient Management Sessions

Each Session is Worth 1 CEU in Nutrient Management

Phosphorus Management Tool Implementation Update (Half Session) -- In this presentation you will get the latest information on the implementation of the Phosphorous Management Tool (PMT). Maryland Department of Agriculture will provide an update on the soils data inventory that was collected statewide along with preliminary data of where farms will be with respect to the "Tier" groups that are required to be established this year. You will also receive information on the 1st year of the economic study that was conducted as a result of the regulations. As professionals you will be reminded of what is required of the PMT as MDA implements the Transition Management Phases of the PMT regulations. *Instructor: Mr. Dwight Dotterer, Maryland Department of Agriculture. Tuesday 10:00 and 11:00 am*

Delmarva Mass Balance: A Model Solution (Half Session) -- How much poultry litter exists on the Delmarva? Are we in a nutrient surplus or a nutrient deficit? How much litter can be applied to new alternative uses? The limiting factor in answering these questions is a lack of reliable and comparable data between three state jurisdictions with different laws and reporting criteria. The Chesapeake Bay Model presents a unique opportunity to utilize a fresh dataset whose conditions have been agreed upon by the three state jurisdictions and guided by experts in the agricultural field. This presentation will outline a potential path forward for the modification and use of this data set for

mass balance purposes. *Instructor: Mr. Christopher Brosch, Delaware Department of Agriculture. Tuesday 10:00 and 11:00 am*

Managing the Value of Poultry Litter: Parts I and II -- Poultry litter, like any other agricultural nutrient input, provides value and comes at a cost. Beyond the on-farm economics, poultry litter use can have environmental value and costs. We can control the economic and agronomic cost and value of poultry largely through how we manage this resource. In Parts I and II of this three part series, Drs. Ritchey and McGrath will discuss the influence of poultry litter application timing, method, and rate on nutrient availability, environmental impact, and ultimately its value. In the Part III of the series, Dr. Shockley will present an Excel-based decision guide for producers to compare the value of poultry litter under various management scenarios. The goal of this three part series is to demonstrate that the agronomic, economic, and environmental best management practices for poultry litter align. *Instructors: Dr. Josh McGrath and Dr. Edwin Ritchey, University of Kentucky. Part I: Tuesday 1:00 and 2:00pm; Part II: Tuesday 3:10 and 4:10pm*

Managing the Value of Poultry Litter Part III: Determining the Economic Value of Poultry Litter -- The economic value of poultry litter will vary depending on the nutrient content, market price for commercial fertilizer, management strategies (i.e. nutrient availability), transportation cost, and individual soil test data. Also, due to the variability in nutrient content of poultry litter there is an inherent economic risk from utilizing litter as a nutrient source. A Microsoft Excel based decision guide for producers is presented to compare the value to the cost of litter, determine the maximum distance for hauling litter, and the economic risk from not measuring litter for nutrient content. The goal of the three part series is to demonstrate that the agronomic, economic, and environmental best management practices for poultry litter align. *Instructor: Dr. Jordan Shockley, University of Kentucky. Wednesday 8:00 and 9:00am*

Sulfur Update for Agricultural Crops -- Nationally, sulfur (S) deficiencies are increasing due to reduced impurities in commercial fertilizers, lower atmospheric S deposition, and increased crop yields. Although S deficiencies are seldom observed in Kentucky, some producers question the need for supplemental S fertilization. The results of tissue surveys and response trials in wheat and alfalfa will be discussed. *Instructor: Dr. Edwin Ritchey, University of Kentucky. Wednesday 10:10 and 11:10am*

Getting the Most out of Plant Tissue Data -- Crop production decisions are constantly adjusted during the growing season and often the result of in-season testing tools such as plant tissue analysis. This presentation will

provide a detailed overview of the purpose, benefits, challenges and data trends relating to plant tissue analysis. *Instructor: Mr. Bill Rohrer, AgroLab Inc. Wednesday 1:00 and 2:00pm*

All You Need to Know about Phosphorus -- Phosphorus management is a major focus in agricultural systems in Maryland and the Mid-Atlantic Region. In order to properly manage P, producers should understand P forms in soils and different routes P can be lost. This presentation will outline P behavior in soils and explain the science and justification for a P Index. Results of a long-term P drawdown study performed in Maryland will also be presented. *Instructor: Dr. Nicole Fiorellino, Chesapeake College. Wednesday 3:10 and 4:10pm*

Utilizing and Integrating Different Sensor Platforms in a Nitrogen Management System -- Increasing nitrogen (N) use efficiency is a priority in agronomic management systems, particularly corn production. Active and passive crop canopy sensors have provided a means to quantitatively assess N status of a crop. However, with many different sensor platforms, integrating these systems together can be a challenge. Understanding the challenges associated with different sensor platforms, and integrating them into a N management system are necessary for growers and consultants to fully utilize this technology. *Instructor: Dr. Brian Krienke, University of Nebraska. Thursday 8:00 and 9:00am*

At Planting Fertilizer Management -- Farmers have been applying starter fertilizer at planting for many years. However, this practice has expanded and varied over the years to include: traditional starter, pop-up, N applied with the planter, etc. There are a number of important factors that must be considered for applying fertilizer at-planting including materials, rates, and placement for maximum agronomic efficiency and to minimize risk to the plants. *Instructor: Dr. Doug Beegle, Penn State University. Thursday 8:00 and 9:00am*

Understanding Ammonia Volatilization Loss and Urease Inhibitors -- Urea based fertilizers are widely used due to their high N analysis and dry-granular formulation. However, urea is prone to loss via ammonia volatilization if the environmental conditions are unfavorable and as much as 30-40% of the total fertilizer-N can be lost. Urease inhibitors can effectively reduce ammonia volatilization losses when used correctly, but they must meet certain criteria in order to be effective. The benefits and criterion for effective use of urease inhibitors for increased N use efficiency will be discussed. *Instructor: Dr. Trenton Roberts, University of Arkansas. Thursday 10:10 and 11:10am*

Are Changes in Rainfall Chemistry Linked to Increased P Availability and Loss? -- Power plants are

required to scrub sulfur from exhaust in order to combat acid rain. Decreased S concentrations in rainfall has led to increased rainfall pH. However, in the Midwestern US, crop consultant's report fewer incidences of P deficiency, while S deficiencies have increased over the last decade. Could changes in rainfall chemistry also lead to changes in P availability to crops? Further, is it possible that these changes in rainfall chemistry are increasing the P loss to waterways? *Instructor: Dr. Doug Smith, USDA-ARS, Temple, TX. Thursday 10:10 and 11:10am*

IV. Pest Management Sessions

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

Application of Unmanned Aerial Systems (UASs) for Pest Management: Opportunities and Challenges -- This session will introduce different types of Unmanned Aerial Vehicles (UAVs) with potential applications in production agriculture, and discuss various research and commercial applications of UASs in agricultural operations with a special emphasis on pest control. The session will also discuss various current challenges and future opportunities (technological and legal) for timely and efficient management of pests in various types of crops. *Instructor: Dr. Manoj Karkee, Washington State University. Tuesday 10:00 and 11:00 am*

Herbicide Resistant Weeds, Observations and Lessons from North Carolina -- Herbicide-resistance is a major problem for farmers in North Carolina. This session will examine the development and spread of herbicide-resistance. What factors have led the development of resistance in NC and what lessons can be shared for DE, MD and the region? *Instructor: Dr. Wes Everman, North Carolina State University. Tuesday 1:00 and 2:00pm*

Herbicide-Resistance: The Nuts and Bolts of Making it Work -- Herbicide-resistance weeds are spreading across the Mid-Atlantic Region and complicating weed management decisions for farmers and crop consultants. Extension and ag-industry has developed general guidelines for resistance management and there are some great resources available to assist with planning. In an interactive session, considerations for herbicide-resistance management strategies will be discussed and small working groups will develop their own programs using available resources. *Instructors: Mr. Dwight Lingenfelter, Penn State University; Dr. Mark VanGessel, University of Delaware. Tuesday 3:10 and 4:10pm*

Growing Malting Barley for Local Craft Beverage Markets: Early Lessons from New York State -- This session will address what has been learned in three years of research and commercial production in New York about best practices that enhance the quality of malting

barley to meet malt house specifications. Variety selection, cultural practices, fertilization, fungicides, harvest timing, and post-harvest management are critical components. Special attention is given to reducing the risk of *Fusarium* mycotoxin contamination. *Instructor: Dr. Gary C. Bergstrom, Cornell University. Wednesday 8:00 and 9:00am*

Weed Management in Vegetables: Using a Truly Integrated Approach -- Most strategies utilized for managing weeds in vegetable systems rely heavily on tillage and/or chemical inputs. However, reliance on one or a few management tactics goes against the principle of Integrated Weed Management. Further, using similar weed management practices year to year allows certain weed species to become dominant in the system, and over time, these weeds become hard to manage. Integrated weed management combines several tools. The integration of several weed management tools (cover cropping, reduced tillage, herbicide banding, crop rotation, mulches, etc.) will be discussed for their potential to create a more sustainable weed management program in vegetable production that is in greater compliance with conservation agriculture. *Instructor: Dr. Cerruti RR Hooks, University of Maryland, College Park. Wednesday 10:10 and 11:10am*

Frogeye Leaf Spot of Soybean: Disease Management and Fungicide Resistance -- Frogeye leaf spot (FLS) is an important foliar disease of soybean in the US. Historically, FLS was controlled relatively easily with foliar fungicides, but in 2010, strains of the FLS pathogen with resistance to strobilurin fungicides began to appear in the US. Strobilurin-resistant strains of the FLS pathogen have continued to spread across the US, making disease control much more challenging. The latest information on fungicide resistance and management of FLS will be discussed. *Instructor: Dr. Carl Bradley, University of Kentucky. Wednesday 1:00 and 2:00pm*

Using Insecticide Seed Treatments in Agronomic Crops -- Insecticide seed treatments are a convenient and economical way to preventatively manage early-season insect pests. The use of these treatments is controversial due to the class of insecticide (neonicotinoids), preventative nature of the application, and amount of usage in the US. This session will discuss the pests targeted, pest suppression benefits, and potential risks of insecticide seed treatment use in Mid-Atlantic agronomic crops to aid insect pest management decisions. *Instructor: Dr. Kelly Hamby, University of Maryland, College Park. Wednesday 3:10 and 4:10pm*

V. Soil and Water Management Sessions

Each Session is Worth 1 CEU in Soil and Water Management

Comprehensive Drainage Management Approach to Reduce Nutrients in Agricultural Drainage Waters --

Controlling nutrient loss from artificially drained agricultural lands requires a comprehensive approach that balances drainage, water quality, and production priorities. Our work in the Atlantic Coastal Plain of Maryland and Virginia demonstrates significant edge-of-field and in-ditch reductions in nitrogen and phosphorus export using drainage control structures, permeable reactive barriers, and woodchip bioreactors. This presentation will provide an overview of the implementation of these ditch management systems, demonstration of their effectiveness in reducing nutrient loss, and a brief review of their cost-effectiveness. *Instructor: Dr. Amy Collick, University of Maryland Eastern Shore. Tuesday 10:00 and 11:00 am*

Beneficial Use of Gypsum in Crop Production and Soil Management -- Gypsum is more than a source of plant-available calcium and sulfate. Research has shown gypsum may be effective at increasing soil aggregation, reducing erosion, reducing soluble phosphorus, and ameliorating subsoil acidity. A review of recent research will illustrate what can be expected. *Instructor: Dr. Patricia Steinhilber, University of Maryland, College Park. Tuesday 1:00 and 3:10pm*

Using the Rainfall Simulator to Demonstrate the Impact of Management Systems on Soil Health -- The rainfall simulator has become one of the most effective methods of demonstrating the impacts of various farming practices on soil health and soil health indicators. When soil health is improved, the water cycle improves by increasing infiltration and reducing runoff. Other cycles, such as the carbon and nutrient cycle can also be impacted. This demonstration will compare conventional versus reduced tilled cropping systems and well managed grazing versus overgrazed pasture systems. *Instructor: Steve Woodruff, USDA-NRCS. Tuesday 2:00 and 4:10pm*

Do You Really Need a Soil Health Test? -- Building soil organic matter and establishing healthy soils is paramount for having healthy farms and crops. Many laboratories offer soil tests that quantify different aspects of soil health with the goal of helping guide management decisions. But, what do you really need to know from a soil test? This talk will outline various soil health testing methods compared across laboratories and explain their importance. Comparisons of these tests collected from on-farm trials will provide a better understanding of their interpretations and allow you to determine which tests are most appropriate for your specific on-farm management needs. *Instructor: Dr. Kristy Borrelli, Penn State University. Wednesday 8:00 and 9:00am*

Alternative Methods of Cover Crop Seeding -- In this presentation we will review some of the alternatives to the standard method of drilling cover crops following harvest. These will include intercropping methods, in-season manure cover crop applications, vertical tillage,

broadcasting cover crops with high boy and aerial applicators, and others. We will discuss factors such as crop management, species, seeding rates, timing, and environment as potential ways to achieve the most success with each system. For those that are just being developed we will discuss some of the issues that need to be considered as research objectives here in the Mid-Atlantic. *Instructor: Dr. Greg Roth, Penn State University. Wednesday 10:10 and 11:10am*

Chesapeake 4R Alliance: Finding Profitable Solutions for Ag and Our Bay -- Working to improve 4R Nutrient Stewardship can offer opportunities to increase profitability for both farmers and their crop consultants, while also improving water quality and habitat. The Chesapeake 4R Alliance is a partnership founded by the Delaware Maryland Agribusiness Association and The Nature Conservancy, to identify nutrient stewardship practices that are a good fit for our region's agricultural systems and also benefit the environment. Our farmers have said that they need information, technical services and/or funding to adopt advanced 4R practices. This session will discuss available funding options, and explore how CCAs and agribusiness can support increased adoption of 4R practices. *Instructor: Ms. Jennifer Nelson, The Nature Conservancy. Wednesday 1:00 and 2:00pm*

NRCS Resource Stewardship Evaluation: A New Framework for Achieving Conservation Stewardship Goals, Landscape Resiliency and Sustainability - The USDA Natural Resources Conservation Service (NRCS) is piloting the new Resource Stewardship Evaluation (RSE) tool and service, which provides farmers with a roadmap to achieve their natural resources stewardship goals, landscape resiliency and sustainability. The RSE tool is designed to improve planning efficiency and measure environmental benefits. It is being developed with the expectation of receiving additional incentives for achieving a stewardship threshold. The presentation includes a background discussion of the tool, local pilots, insights from the past 2 years, and a tool demonstration. Efforts to harmonize stewardship metrics with various industry partners and sustainability groups will also be discussed. Speakers include RSE developers, users, and a client farmer. *Instructors: Mr. Chris Gross, Mr. Aaron Lauster, and Ms. Christy Brown, USDA-NRCS. Wednesday 3:10 and 4:10pm*

Getting Conservation into Nutrient Management Plans using Open Source Software - This session will include a variety of topics that will enable nutrient management planners to generate comprehensive nutrient management plans (CNMPs) that incorporate conservation practices using USDA and online (free) software. Specific topics will include shapefile development using Missouri Clipper; Map Windows GIS; USDA's Geospatial Nutrient Tool (GNT) to

determine state-by-state setback criteria and incorporating these features into shapefiles; adding developed shapefiles to MMP software; review of MMP data entry with an overview of Demonstration Farm; review of RUSLE 2 external version and MMP internal version; review of the new NRCS Comprehensive Nutrient Management Planning policy released October 19, 2015; and MMP P-index system, input needs and scenario features. *Instructors: Mr. Tom Basden and Mr. Justin Brackenrich, West Virginia University; Mr. Chris Gross and Mr. Isaac Wolford, USDA-NRCS. Thursday 8:00 and 10:10am NOTE: This is a DOUBLE session.*

VI. Climate Session (Tuesday and Thursday)

CEUs for each session are provided after the abstract

Enhancing Food Security in the Northeast through Regional Food Systems -- Researchers are mapping an array of county-level data from Maine to Virginia on weather, soil, land use, water availability and other elements. This information is being used to model potential crop production and find out where local food production could meet current and projected demand. Relying more on the strategic production of locally grown food can counter the challenges of rising transport costs, growing population demands and vanishing farmlands. This research includes climate predictions and crop response models specific to the Northeast. *Instructor: Dr. David H. Fleisher, USDA-ARS, Beltsville, MD. Tuesday 10:00 and 11:00 am*

Weathering Water Extremes in the Changing Climate of the Mid-Atlantic Region: Past Trends and a Glimpse into the Future -- Climate change has emerged as a critical issue facing agriculture and water resources in the US. This presentation draws upon recent findings from the US National Climate Assessment, as well as regional and local assessments of long-term trends in precipitation, temperature, and streamflow, to highlight fluctuations in weather, seasons, and watershed hydrology as a consequence of climate change in the Mid-Atlantic region. The seminar also will explore future climate change projections for the region using daily time-series of downscaled climatic data from nine regional climate models. While past changes in regional hydroclimate suggest some challenges for producers and water managers, most notably with increased fall runoff, other changes such as expanded growing seasons can be viewed in a positive light. Future changes in climate, particularly if society continues to follow the business as usual emissions pathway, will likely pose much greater challenges to farmers and land managers as extreme events such as intense rainfalls and droughts are expected to occur with greater regularity in the Mid-Atlantic region. *Instructor: Dr. Anthony Buda, USDA-ARS, University Park, PA. Tuesday 1:00 and 2:00pm*

From Leaf to Canopy: Measuring CO₂ and Temperature Effects on Crop Growth

-- Climate change predictions include shifts in average temperature, atmospheric carbon dioxide concentration (CO₂), and precipitation patterns and intensities away from their historical mean values. Changes in these environmental factors will profoundly impact crop production in the majority of agriculturally productive regions throughout the world. Tools to understand and quantify effects of these factors on our major crop commodities are required in order to assess impact on global future food security, and develop adaptation methods. Data from controlled environment growth chambers for this purpose is particularly useful because it permits measurement of crop response to one or two factors varied independently from other production inputs. Experimental results from soil-plant-atmosphere research chambers were obtained on the response of major commodities, including corn and potato, to climate change factors including temperature, CO₂, and interactions between them. *Instructor: Dr. David H. Fleisher, USDA-ARS, Beltsville, MD. Tuesday 3:10 and 4:10pm*

Adaptive Management Strategies to Alleviate the Impacts of Sea Level Rise on Agricultural Lands

-- Sea level continues to rise at an increasing rate due to climate change. This is especially noticeable in the Mid-Atlantic States where agricultural producers in near coastal areas are more frequently dealing with salt water flooding from coastal storms. This training will expose participants to several short term and viable longer term practices to deal with this issue. Some methods to be discussed include adding appropriate soil amendments, implementing possible cultivation techniques, establishing riparian buffers, and selecting alternative salt-adapted crops and conservation plantings. The use of brackish irrigation water sources on soils flooded by storm tides and the possible impacts management of coastal fields might have on the broader area of coastal zone management will be discussed. *Instructors: Mr. Christopher Miller, USDA-NRCS; Dr. Jack Gallagher and Dr. Denise Seliska, University of Delaware. Thursday 8:00 and 9:00am*

Climate Change Mitigation Strategies for Horticultural Crops

-- In this session strategies to mitigate effects of a changing climate in horticultural crops will be presented with a focus on research with particle film technologies, shade technologies, and protected culture. Information will also be presented on breeding efforts in vegetable crop directed at impacts of a changing climate, such as selecting for improved pollen viability under heat stress. Also discussed will be changing climate zones and effects on perennial

horticultural crops. Vulnerability of horticultural crops to extreme weather events will also be detailed. *Instructor: Dr. Gordon Johnson and Ms. Emmalea Ernest, University of Delaware. Thursday 10:10 and 11:10am*

VII. Crop School on Wheels (Wednesday)

CEUs for each session are provided after the stop information.

Tour Departs the Princess Royale at 7:30 am sharp and will return by approximately 5 pm. Please arrive at the bus no later than 7:25 am. *Note: If you select to participate in this tour you will not be permitted to select or attend any other sessions to attend on Wednesday. Space is limited. Refreshments and box lunch will be provided. Tour Coordinators: Dr. Bob Kratochvil and Dr. Jarrod Miller, University of Maryland. (CEU = 6)*

This popular event returns with the following stops scheduled. There will be a total of 6 stops as listed below plus discussion on the bus between stops providing a total of 300 minutes of training split among crop management, nutrient management, pest management, and soil and water management.

1. Tidal Inundation of Agricultural Land. Site visit near Princess Anne, MD. *Instructors: Mr. Larry Fykes, Somerset County Soil Conservation District and Ms. Dani Weissman, University of Maryland (CEU = 1, Soil and Water)*
2. Certified Seed Production from Field to Bag. Wimberly Farms, Princess Anne, MD. *Instructor: Mr. Kevin Anderson, Wimberly Farms (CEU = 1, Crop Management)*
3. Ditch Filters for Phosphorus Management. Ditch filter site is near Crisfield, MD. *Instructor: Dr. Joshua McGrath, University of Kentucky (CEU = 1, Soil and Water).*
4. Unmanned Aircraft Systems (Drones): Applications for Agriculture and other Industries. University of Maryland UAS Test Site. Crisfield, MD airport. *Instructors: Mr. Tony Pucciarella (CEU = 0.5, Crop Management; 0.5 Pest Management)*
5. On Farm Anaerobic Digestion. Site of this working anerobic digester is near Pocomoke, MD. *Instructors: Mr. Andy Moss and Mr. Jason Lambertson (CEU = 1, Nutrient Management)*
6. Burley Oak Brewery, Berlin, MD. Learn about the brewing process including the use of locally grown ingredients. *Instructors: TBD (CEU = 1, Crop Management)*

2016 Crop Management School Workshop Schedule

Tuesday, November 15, 2016

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management Palmetto 4 & 5 (upstairs)	Pest Management Dominica & Eleuthera (downstairs)	Soil and Water Mgt. Barbados & Cayman (downstairs)	Climate Session Palmetto 1 (upstairs)
10:00 - 10:50	Meeting the Demand for Quality Soft Red Winter Wheat <i>Dr. Bob Kratochvil</i>	Phosphorus Management Tool and Delmarva Mass Balance Updates <i>Mr. Dwight Dotterer and Mr. Chris Brosch</i>	Application of Unmanned Aerial Systems (UASs) for Pest Management <i>Dr. Manoj Karkee</i>	Comprehensive Drainage Management Approach to Reduce Nutrients in Agricultural Drainage Waters <i>Dr. Amy Collick</i>	Enhancing Food Security in the Northeast through Regional Food Systems <i>Dr. David H. Fleisher</i>
11:00 - 11:50	Meeting the Demand for Quality Soft Red Winter Wheat <i>Dr. Bob Kratochvil</i>	Phosphorus Management Tool and Delmarva Mass Balance Updates <i>Mr. Dwight Dotterer and Mr. Chris Brosch</i>	Application of Unmanned Aerial Systems (UASs) for Pest Management <i>Dr. Manoj Karkee</i>	Comprehensive Drainage Management Approach to Reduce Nutrients in Agricultural Drainage Waters <i>Dr. Amy Collick</i>	Enhancing Food Security in the Northeast through Regional Food Systems <i>Dr. David H. Fleisher</i>
11:50 - 1:00	LUNCH BREAK				
1:00 - 1:50	How to Increase Chances of Having a Successful On-Farm Trial: Part 1 <i>Mr. Josh Sievers</i>	Managing the Value of Poultry Litter: Part I <i>Dr. Josh McGrath</i>	Herbicide Resistant Weeds, Observations and Lessons from North Carolina <i>Dr. Wes Everman</i>	Beneficial Use of Gypsum in Crop Production and Soil Management <i>Dr. Patricia Steinhilber</i>	Weathering Water Extremes in the Changing Climate of the Mid-Atlantic Region <i>Dr. Tony Buda</i>
2:00 - 2:50	How to Increase Chances of Having a Successful On-Farm Trial: Part 1 <i>Mr. Josh Sievers</i>	Managing the Value of Poultry Litter: Part I <i>Dr. Josh McGrath</i>	Herbicide Resistant Weeds, Observations and Lessons from North Carolina <i>Dr. Wes Everman</i>	Using the Rainfall Simulator to Demonstrate the Impact of Management Systems on Soil Health <i>Mr. Steve Woodruff</i> *Pool Atrium Area*	Weathering Water Extremes in the Changing Climate of the Mid-Atlantic Region <i>Dr. Tony Buda</i>

Tuesday, November 15, 2016 (Continued)

2:50 - 3:10	BREAK				
3:10 - 4:00	Soybean Nutrient Needs: These Aren't Your Grandpa's Varieties <i>Dr. Shaun Casteel</i>	Managing the Value of Poultry Litter: Part II <i>Dr. Edwin Ritchey</i>	Herbicide-Resistance: The Nuts and Bolts of Making it Work <i>Mr. Dwight Lingenfelter and Dr. Mark VanGessel</i>	Beneficial Use of Gypsum in Crop Production and Soil Management <i>Dr. Patricia Steinhilber</i>	From Leaf to Canopy: Measuring CO ₂ and Temperature Effects on Crop Growth <i>Dr. David H. Fleisher</i>
4:10 - 5:00	Soybean Nutrient Needs: These Aren't Your Grandpa's Varieties <i>Dr. Shaun Casteel</i>	Managing the Value of Poultry Litter: Part II <i>Dr. Edwin Ritchey</i>	Herbicide-Resistance: The Nuts and Bolts of Making it Work <i>Mr. Dwight Lingenfelter and Dr. Mark VanGessel</i>	Using the Rainfall Simulator to Demonstrate the Impact of Management Systems on Soil Health <i>Mr. Steve Woodruff</i> *Pool Atrium Area*	From Leaf to Canopy: Measuring CO ₂ and Temperature Effects on Crop Growth <i>Dr. David H. Fleisher</i>

Wednesday, November 16, 2016

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management Palmetto 4 & 5 (upstairs)	Pest Management Dominica & Eleuthera (downstairs)	Soil and Water Mgt. Barbados & Cayman (downstairs)	Crop School on Wheels (Off-site)
8:00 - 8:50	How to Increase Chances of Having a Successful On-Farm Trial: Part 2 <i>Mr. Josh Sievers</i>	Managing the Value of Poultry Litter: Part III <i>Dr. Jordan Shockley</i>	Growing Malting Barley for Local Craft Beverage Markets <i>Dr. Gary C. Bergstrom</i>	<i>Do You Really Need a Soil Health Test? Dr. Kristy Borrelli, Penn State University</i>	Tour
9:00 - 9:50	How to Increase Chances of Having a Successful On-Farm Trial: Part 2 <i>Mr. Josh Sievers</i>	Managing the Value of Poultry Litter: Part III <i>Dr. Jordan Shockley</i>	Growing Malting Barley for Local Craft Beverage Markets <i>Dr. Gary C. Bergstrom</i>	<i>Do You Really Need a Soil Health Test? Dr. Kristy Borrelli, Penn State University</i>	
9:50 - 10:10	BREAK				
10:10 - 11:00	Precision Agriculture Update <i>Mr. Dave Wharry</i>	Sulfur Update for Agricultural Crops <i>Dr. Edwin Ritchey</i>	Weed Management in Vegetables <i>Dr. Cerruti RR Hooks</i>	<i>Alternative Methods of Cover Crop Seeding Dr. Greg Roth, Penn State University</i>	Tour
11:10 - 12:00	Precision Agriculture Update <i>Mr. Dave Wharry</i>	Sulfur Update for Agricultural Crops <i>Dr. Edwin Ritchey</i>	Weed Management in Vegetables <i>Dr. Cerruti RR Hooks</i>	<i>Alternative Methods of Cover Crop Seeding Dr. Greg Roth, Penn State University</i>	
12:00 - 1:00	LUNCH BREAK				
1:00 - 1:50	Breaking Bean Barriers: The Next Generation <i>Dr. Shaun Casteel</i>	Getting the Most Out of Plant Tissue Data <i>Mr. Bill Rohrer</i>	Frogeye Leaf Spot of Soybean <i>Dr. Carl Bradley</i>	Chesapeake 4R Alliance <i>Ms. Jennifer Nelson</i>	Tour
2:00 - 2:50	Breaking Bean Barriers: The Next Generation <i>Dr. Shaun Casteel</i>	Getting the Most Out of Plant Tissue Data <i>Mr. Bill Rohrer</i>	Frogeye Leaf Spot of Soybean <i>Dr. Carl Bradley</i>	Chesapeake 4R Alliance <i>Ms. Jennifer Nelson</i>	
2:50 - 3:10	BREAK				

Wednesday, November 16, 2016 (Continued)

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management Palmetto 4 & 5 (upstairs)	Pest Management Dominica & Eleuthera (downstairs)	Soil and Water Mgt. Barbados & Cayman (downstairs)	Crop School on Wheels (Off-site)
3:10 - 4:00	Big Data and Implications at the Farm <i>Dr. John Fulton</i>	All You Need to Know About Phosphorus <i>Dr. Nicole Fiorellino</i>	Using Insecticide Seed Treatments in Agronomic Crops <i>Dr. Kelly Hamby</i>	NRCS Resource Stewardship Evaluation <i>Mr. Chris Gross, Mr. Aaron Lauster, and Ms. Christy Brown</i>	Tour
4:10 - 5:00	Big Data and Implications at the Farm <i>Dr. John Fulton</i>	All You Need to Know About Phosphorus <i>Dr. Nicole Fiorellino</i>	Using Insecticide Seed Treatments in Agronomic Crops <i>Dr. Kelly Hamby</i>	NRCS Resource Stewardship Evaluation <i>Mr. Chris Gross, Mr. Aaron Lauster, and Ms. Christy Brown</i>	

Thursday, November 17, 2016

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management I Palmetto 4 & 5 (upstairs)	Nutrient Management II Barbados & Cayman (downstairs)	Soil and Water Mgt. I Dominica & Eleuthera (downstairs)	Climate Session Palmetto 1 (upstairs)
8:00 - 8:50	Generating Useful Data with Precision Ag Technology <i>Dr. John Fulton</i>	Utilizing and Integrating Different Sensor Platforms in a Nitrogen Management System <i>Dr. Brian Krienke</i>	At Planting Fertilizer Management <i>Dr. Doug Beegle</i>	Getting Conservation into Nutrient Management Plans using Open Source Software <i>Mr. Tom Basden, Mr. Justin Brackenrich, Mr. Chris Gross, and Mr. Isaac Wolford</i>	Adaptive Management Strategies to Alleviate the Impacts of Sea Level Rise on Agricultural Lands <i>Mr. Christopher Miller, Dr. Jack Gallagher, and Dr. Denise Seliska</i>
9:00 - 9:50	Generating Useful Data with Precision Ag Technology <i>Dr. John Fulton</i>	Utilizing and Integrating Different Sensor Platforms in a Nitrogen Management System <i>Dr. Brian Krienke</i>	At Planting Fertilizer Management <i>Dr. Doug Beegle</i>		Adaptive Management Strategies to Alleviate the Impacts of Sea Level Rise on Agricultural Lands <i>Mr. Christopher Miller, Dr. Jack Gallagher, and Dr. Denise Seliska</i>
9:50 - 10:10	BREAK				
10:10 - 11:00	Closing the Yield Gap Between Double Crop and Full Season Soybeans <i>Dr. David Holshouser</i>	Understanding Ammonia Volatilization Loss and Urease Inhibitors <i>Dr. Trenton Roberts</i>	Are Changes in Rainfall Chemistry Linked to Increased P Availability and Loss? <i>Dr. Doug Smith</i>	Getting Conservation into Nutrient Management Plans using Open Source Software <i>Mr. Tom Basden, Mr. Justin Brackenrich, Mr. Chris Gross, and Mr. Isaac Wolford</i>	Climate Change Mitigation Strategies for Horticultural Crops <i>Dr. Gordon Johnson and Ms. Emmalea Ernest</i>
11:10 - 12:00	Closing the Yield Gap Between Double Crop and Full Season Soybeans <i>Dr. David Holshouser</i>	Understanding Ammonia Volatilization Loss and Urease Inhibitors <i>Dr. Trenton Roberts</i>	Are Changes in Rainfall Chemistry Linked to Increased P Availability and Loss? <i>Dr. Doug Smith</i>		Climate Change Mitigation Strategies for Horticultural Crops <i>Dr. Gordon Johnson and Ms. Emmalea Ernest</i>



Mid-Atlantic Crop Management School

2016 Planning Committee

Planning Committee Chairpersons

Current Chair

Dr. Amy Shober – University of Delaware

Past Chair

Dr. Richard Taylor – University of Delaware

Incoming Chair

Dr. Jarrod Miller – University of Maryland

CEU Coordinators

Ms. Sydney Riggi – University of Delaware

Mr. Bill Cissel – University of Delaware

Evaluation Coordinator

Ms. Jennifer Volk – University of Delaware

Facilities Coordinators

Dr. Ron Ritter – University of Maryland

Mr. Joe Hatton – West Virginia Soil Conservation Agency

IT Coordinator

Mr. Juan Castellanos – University of Delaware

Recording Coordinator

Mr. Craig Yohn – University of Maryland

Program Teams

Crop Management

Dr. Cory Whaley (Leader) – University of Delaware

Mr. Philip Sylvester – University of Delaware

Dr. Jason Wight – University of Maryland

Nutrient Management

Dr. Jarrod Miller (Leader) – University of Maryland

Dr. Nicole Fiorellino – Chesapeake College

Dr. Josh McGrath – University of Kentucky

Dr. Mark Reiter – Virginia Tech

Dr. Amy Shober – University of Delaware

Pest Management

Mr. Bill Cissel (Leader) – University of Delaware

Dr. Nathan Kleczewski – University of Delaware

Dr. Burkhard Schultz – University of Maryland

Dr. Mark VanGessel – University of Delaware

Soil and Water Management

Ms. Jennifer Volk (Leader) – University of Delaware

Mr. Tom Basden – West Virginia University

Ms. Christy Brown – USDA NRCS

Mr. Chris Gross – USDA NRCS

Mr. Isaac Wolford – USDA NRCS (West Virginia)

Climate

Dr. Gordon Johnson (Leader) – University of Delaware

Crop School on Wheels

Dr. Bob Kratochvil (Leader) – University of Maryland

Mr. Jim Lewis – University of Maryland

Dr. Jarrod Miller – University of Maryland



Mid-Atlantic Crop Management School

November 15-17, 2016

Princess Royale Hotel and Conference Center, Ocean City, MD

Sponsored by the University of Delaware, University of Maryland, and West Virginia University Cooperative Extension Systems, Mid-Atlantic Certified Crop Advisor (CCA) Board, and the United States Department of Agriculture-Natural Resource Conservation Service (USDA-NRCS).

Cooperative Extension Education in Agriculture and Home Economics, University of Delaware, Delaware State University, and the United States Department of Agriculture cooperating. Distributed in furtherance of Acts of Congress of May 8 and June 30, 1914. Delaware Cooperative Extension, University of Delaware. It is the policy of the Delaware Cooperative Extension System that no person shall be subjected to discrimination on the grounds of race, color, sex, disability, age or national origin.

*Dr. Amy Shober
University of Delaware
Dept. Plant and Soil Sciences
531 S. College Avenue; 152 TNS
Newark, DE 19716*

*Dr. Jarrod Miller
University of Maryland Extension
Somerset, Wicomico and Worcester Counties
30703 Park Drive
Princess Anne, MD 21853*