

Announcing the  
20<sup>th</sup> Annual



# Mid-Atlantic Crop Management School

November 18-20, 2014

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.

This year, the popular all-day tour returns to Crop School. This year's tour will highlight horticultural stops featuring production in greenhouse, nursery, high tunnel, organic, small fruit and orchard systems, vegetable packing, and a stop at a vineyard/winery. *Participants attending this tour will not be able to register for any other sessions on Wednesday. Space is limited.*

## 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 2014 Mid-Atlantic Crop Management School will offer CCA continuing education units (CEU's) approved by the Certified Crop Adviser Program in the following categories:

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

Total CEU's 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 31**. After that date the fee will be **\$325**, and must be received by **November 10**. 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 basis. Breakout sessions will be limited to 100 participants in each session with the exception of the 5<sup>th</sup> session which has attendee limitations.**

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

Visit <http://psla.umd.edu/extension/md-crops> 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 University of Maryland Conferences & Visitor Services at 301-314-0324 or [crop\\_registration@umd.edu](mailto:crop_registration@umd.edu).

## Cancellation Policy –

- All cancellations must be submitted in writing via email to [crop\\_registration@umd.edu](mailto:crop_registration@umd.edu)
- Cancellation requests received on or before November 10 are fully refundable, less a processing fee of \$25.00.
- No refunds after November 10.
- Substitutions are allowed at no additional cost provided notification is sent to [crop\\_registration@umd.edu](mailto:crop_registration@umd.edu) prior to the event start date.

## Hotel Reservation Information

The Princess Royale Oceanfront Hotel and Conference Center is located at 91<sup>st</sup> 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 10** to guarantee the rates below.

\$65 per night (plus applicable taxes) – Oceanview/Poolview Suite

\$90 per night (plus applicable taxes) – Oceanfront Suite

## ***I. Registration***

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General registration will begin 8:30 a.m. on November 18. Registration packets and information regarding CEU's and recertification 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 18.

## ***II. Crop Management Sessions***

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

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**Keys to Producing High Soybean Yields** - There are some fundamental things that must occur in a soybean field to get high yields. We will discuss what systems are needed for soybean high yields, what parts are universal, and what components are necessary at a local level. Throughout, we will discuss how certain products and practices fit into a high yield system. *Instructor: Dr. Chad Lee, University of Kentucky*

**Intensive Wheat Management** - Introducing intensive wheat management strategies changed wheat production and the wheat industry in Kentucky. Wheat is no longer an after-thought for our producers but an essential component to a successful grain and oilseed system. We will discuss intensive wheat management and what components may fit into the Mid-Atlantic. *Instructor: Dr. Chad Lee, University of Kentucky*

**Filter the Kool-Aid Before You Drink It** - Frankly, today's agricultural world is teeming with misinformation, half-truths, pseudo-data, and sincere but incompetent researchers. Now that I have your attention, let me just say that I've been wanting to put together a presentation that helps growers and CCAs learn how to distinguish between factual agronomic information and "crap-tual" agronomic information. Come prepared to be educated, entertained, and probably insulted by what I have to say about separating agronomic fact from crap. *Instructor: Dr. Bob Nielsen, Purdue University*

**Grain Drying and Storage Management** - Proper on-farm grain drying, storage and handling of grain can help producers and farm managers control elevator discounts and improve economic returns to their operation. How grain is managed soon after harvest often determines the storability of the crop and can strongly influence its quality when delivered to the end user. This presentation will discuss how to maintain grain quality through the use of proper on-farm grain drying, storage and handling management practices. *Instructor: Dr. Michael Buschermohle, University of Tennessee Extension*

**Precision Ag Technologies for Crop Management**– The development of precision agricultural technologies and their adoption for crop production continues unabated. Most of these technologies revolve around the acquisition and interpretation of spatially variable data of all sorts, but many folks are not completely familiar with spatial data concepts. Sometimes the agronomic knowledge to successfully implement the technology is not yet available or not well grounded in reality. I will try to shed some curmudgeonly-based light on these topics as well as on the challenges that lie ahead to successfully utilize the wonderful

gadgetry we have available for crop production today. *Instructor: Dr. Bob Nielsen, Purdue University*

**Managing Field Variability: Transitioning to Zone Management** - Zone management provides multiple benefits to producers through input savings, improved time, labor and equipment management, and environmental benefits. Zone management enables producers to match crop requirements according to site-specific yield potential rather than applying inputs based on field average. This presentation will cover the types of information typically used to divide production fields into management zones. High quality data and the ability to manipulate these types of data are essential for implementing zone management. *Instructor: Dr. Michael Buschermohle, University of Tennessee Extension*

**Identifying and Interpreting Data Sources for Precision Agriculture** - Accurate precision management of fertilizer, seed, chemicals, and irrigation requires accurate data. In recent years the sources and amount of data available for precision management has grown at a significant rate. However, this has introduced growers and agronomists to imprecise sources of data that could be potentially damaging to their precision management and create inaccuracies in their decision-making processes. This presentation will cover sources of data in precision agriculture and how to interpret and evaluate the information and integrate it into precision management practices. *Instructor: Mr. Tim Woodward, Tellus Agronomics LLC*

**The Role of Small Unmanned Aerial Systems in Agriculture** – Small Unmanned Aerial Systems, commonly referred to as drones, are proving their value in agriculture. This presentation will cover the various uses of drones in agriculture, types of drone systems and capabilities, operation of drones in the field, and current regulations. *Instructor: Mr. Tim Woodward, Tellus Agronomics LLC*

**Grain Sorghum Production Tips for the Mid-Atlantic** - With acreage increasing from 6,000 in 2011 to 100,000 in 2013, grain sorghum is definitely gaining land in the mid-Atlantic. The shift was facilitated by the Murphy-Brown LLC's recent interest to increase production of locally produced grains. The company estimated that sorghum provided 95 percent the energy of corn when feeding swine; therefore they set the market price for grain sorghum to 95 percent that of corn. Availability of "hot" tips for successful sorghum production in the region is, therefore, important. *Instructor: Dr. Maria Balota, Virginia Tech Tidewater AREC*

### **III. Nutrient Management Sessions**

Each Session is Worth 1 CEU in Nutrient Management

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**Advanced P Management for Crop Production and Environmental Stewardship** - Phosphorus (P) management continues to be a hot topic in the Mid-Atlantic driven largely by concerns over water quality. Phosphorus is essential for optimum crop growth. However, if soil P concentrations are built up to the point of saturation the risk of P transport increases. In addition, P can be lost directly from applied P (e.g. manure, biosolids, and fertilizer) depending on how it is applied and the timing relative to precipitation. This is a concern since eutrophication of surface waters is limited by the amount of P available. However, unlike N, P use efficiency has a dubious if non-existent relationship with P loss. In other words, the risk of P loss is not always related to the soil P status or crop need. Instead, P loss must be controlled through management practices that interrupt the transport continuum. Good old fashioned agronomic practices as well as innovative technologies that can limit P loss while protecting crop yield will be discussed. *Instructor: Dr. Joshua McGrath, University of Kentucky and Ms. Nicole Fiorellino, University of Maryland*

**Reading Your Land for Optimal Soil Fertility Recommendations** - Basic soil properties change across the landscape as soil texture varies. We will discuss ways to determine your soil texture, why soil properties vary from texture to texture, and the impact on nutrient retention. The ultimate goal is to increase overall agronomic efficiency by producing the highest yields with the least amount of nutrient inputs. *Instructor: Dr. Mark Reiter, Virginia Tech Eastern Shore AREC*

**Soil Fertility and Nutrient Management of Organic Cropping Systems** – Soil fertility management in organic cropping systems depends on an integrated strategy of building long-term soil N pools using crop rotations that include annual and/or perennial legumes, and on using animal manure and other approved materials. Sole reliance on any one of these sources of N is often insufficient (e.g., legumes) and/or unsustainable (e.g., animal manure). This presentation will discuss some of the challenges and solutions for sustainable soil fertility management in organic grain cropping systems. *Instructor: Dr. John Spargo, Pennsylvania State University*

**Next Generation P Index: Meeting the Needs of Farmers, Planners and the Environment** - The Phosphorus Index has become well established as a useful tool for guiding P management to minimize environmental impact of P application to crop fields. As use of this tool and research on P behavior and management has continued, it is clear that the P Index can be improved to better reflect the risk of P loss to the environment, make it a more useful tool for planners, and to better guide P management to achieve agronomic and environmental goals. A new national effort is underway, including a project in the Chesapeake Bay watershed, to develop the next generation of the P Index. This session will discuss the background for the P Index and provide an update on the work to develop the next generation of the P Index. *Instructor: Dr. Doug Beegle, Pennsylvania State*

**Land Grant University Fertilizer Recommendations: What in the World is Going on Here?** - Land grant university fertilizer recommendations have served as the basis for nutrient applications made to agricultural fields across the US for decades. However, the wide range of fertilizer recommendations for the same crop, yield goal and soil test values from one state to another is almost frightening as fertilizer costs can more than double by crossing a state line. In addition, very few states provide fertilizer management recommendation options appropriate for both leased and owned land, and these recommendations or guidelines are usually rigid and insensitive to producer goals and resources. How credible is our advice to farmers in the real world? Soil and climate variables do not change abruptly at our state boundaries, so why do our fertilizer recommendations? Is it time to consider alternative and more consistent approaches to making fertilizer recommendations based on something other than state boundaries? In this presentation we will show how different fertilizer recommendations can be instituted and provide a potential framework for improving them. *Instructor: Dr. Brad Joern, Purdue University*

**Greenseeker Algorithm Development for the Mid-Atlantic** - Canopy reflectance sensors have been used to estimate the nitrogen (N) fertilizer requirement of crops for more than a decade. There are several sensor brands commercially available; however, most work in the Mid-Atlantic region has been conducted using the GreenSeeker™ (Trimble). GreenSeeker sensors measure the amount of near-infrared light reflectance relative to the amount of red light reflectance and calculates a Normalized Difference Vegetation Index (NDVI). The GreenSeeker algorithm is the formula responsible for converting an NDVI reading from a field to a nitrogen recommendation. Specific algorithms vary in their response to field conditions and NDVI values based on calibrations in a given production region. This presentation will discuss the development of the GreenSeeker algorithms used for Mid-Atlantic wheat and corn production. *Instructor: Dr. Steve Phillips, International Plant Nutrition Institute*

**Corn Nitrogen Management: Can We Make Better In-season Decisions with a Model?** – The year to year variability in optimum fertilizer nitrogen (N) rate within the same field clearly indicates that weather drives soil and fertilizer N transformations and crop N availability in the field. Combine yield monitor data usually show at least a 2:1 ratio in grain yield within the same field, indicating that both soil and topography clearly affect yield as well. To better predict in-season optimum N rates in the field, we developed an N model that couples soil surface and subsurface N mineralization algorithms and soil and fertilizer N transformation and loss processes with terrain attributes that lead to differences in net precipitation. Processes considered in the model include soil and manure N mineralization, nitrification, denitrification, ammonia volatilization, and nitrate leaching, and the model is driven by temperature, soil moisture, pH, and terrain attributes. Readily available data including soil texture, pH, organic matter, daily air temperature, precipitation/irrigation, fertilizer N source, placement, timing, and crop planting/emergence date are used as model inputs. *Instructor: Dr. Brad Joern, Purdue University*

**Vegetable Crop Nutrition for the Mid-Atlantic** - In this session, mineral nutrient recommendations for the major vegetable crops listed in the regional Commercial Vegetable Production Recommendations publication will be reviewed. Results will be presented from fertility studies in sweet corn, cucumbers, melons, beans, tomatoes, peppers, and other vegetable crops being carried out in the region. Specific fertility and nutrient management issues in vegetables will be discussed. *Instructor: Dr. Gordon Johnson, University of Delaware Cooperative Extension*

**Implementing the Mid-Atlantic Corn and Wheat Algorithms for GreenSeeker** - In-season remote sensing using plant spectral reflectance can be used to improve nitrogen rate recommendations for corn in the mid-Atlantic region. Algorithms that estimate these site-specific N rates have been developed for wheat and corn in the region using the GreenSeeker system. The most appropriate algorithms are often region-specific and require user input to produce accurate results. This session will discuss the requirements, user-specific inputs, and the outputs from the Virginia corn and wheat algorithms. *Instructor: Dr. Wade Thomason, Virginia Tech*

**The Science and Practicality of Wheat Nitrogen Management** - By regulation, wheat producers in Maryland are required to use a fall soil nitrate test to determine the need for fall fertilizer nitrogen at planting. Furthermore, the state regulates the date (March 1) allowed for first spring application of nitrogen to the crop. Are these regulated practices practical? Learn about the past 10 years of research that has evaluated fall fertilizer N use and timing of first spring N application date on crop performance and profitability. *Instructor: Dr. Bob Kratochvil, University of Maryland*

**Enhanced Efficiency Nitrogen Management in Conservation Tillage Systems** - Nitrogen (N) management is a critical component of any non-legume cropping system and managing N in conservation tillage systems (no-till and strip-tillage) presents several unique challenges to producers. The purpose of this session is to introduce technologies and management practices which maximize N use efficiency in conservation tillage systems. Understanding the N cycle and the various transformations and loss pathways is critical to maximizing N use efficiencies and grain yields. As the cost of N rises in the global markets, producers need to be aware of technologies and management systems available to get the most out of each pound of applied N. Technologies that reduce N loss through ammonia volatilization, leaching, and denitrification are available on the market. Each target different transformations in the N cycle which are influenced by cultural practices such as no-till production. An example of this, is no-till systems typically have a greater potential for ammonia volatilization (N loss of up to 50% of applied N) than conventional tillage systems. What causes this to be consistently observed in no-till systems? This session will answer that question and elaborate on how ammonia volatilization can be reduced using fertilizer coatings or modified placement of N in no-till systems as well as many more production examples dealing with various N pathways. *Instructor: Dr. William Hunter Frame, Virginia Tech*

#### **IV. Pest Management Sessions**

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

**Mobile Apps for Agriculture** - An increasing number of growers, consultants, and professionals are utilizing tablet and smartphone apps in their agriculture businesses. When used properly, apps can increase product exposure, reach broad audiences, and improve effectiveness in communicating news, educational materials, and support tools. This session will review a selection of tablet and smart phone apps related to the pest management topic. Calculators, ID (identification) and scout Apps will be reviewed. Ag-Apps can assist key stakeholders in the farming decision-making process. *Instructor: Dr. Ignacio Ciampitti, Kansas State University*

**On Target Application Academy** - The On Target Application Academy (OTAA) is a unique educational experience for growers, custom applicators and retailers. OTAA teaches applicators the latest nozzle technology, steps for proper nozzle selection and calibration, and best practices for mitigating drift. The following are major topics covered by this OTAA presentation: nozzle technology, calibration and nozzle selection, drop size selection, strategies to reduce drift and best application practices. *Instructors: Patricia & Lloyd Hipkins, Virginia Tech (2 CEU in PM)*

**Herbicide Mechanism of Action and What it Means** - This session will address how herbicides interact with the specific plant processes (mechanism of action), herbicide mode of action (all processes that kills the plants), and the symptoms observed on crops and weeds. Information will help decisions on herbicide selection, herbicide injury diagnosis, and management of resistant weeds. *Instructor: Dr. Mark VanGessel, University of Delaware*

**Mycotoxins: What Are They and How Did They Get There?** - Mycotoxins, toxins produced by certain types of fungal pathogens commonly associated with crops including corn and wheat, have the potential to significantly impact crop value and food/feed safety. An overview of the different types of mycotoxins, their occurrence and regulation in the food/feed supply, and factors influencing their occurrence will be presented. Strategies for mitigating the risk of mycotoxin contamination will be discussed. *Instructor: Dr. Hillary Mehl, Virginia Tech Tidewater AREC*

**Viruses in Agronomic Crops** - Viruses are non-living particles that hijack the plants own cellular machinery. These pathogens occur in agronomic crops and may cause hidden yield losses and reductions in quality. This talk will cover basic virus biology, epidemiology, and impacts on crop production. The focus will be on viruses occurring in the Mid-Atlantic and emerging virus issues. Management and current research will be discussed where applicable. *Instructor: Dr. Nathan Kleczewski, University of Delaware*

**How to Best Use Neonicotinoid Insecticides In Vegetable and Field Crops to Minimize Impact on Pollinators** – Over the past year, the use of neonicotinoid insecticides including seed treatments, at planting applications, and foliar uses in field and vegetable crops has received a great deal of review. EPA has new pesticide label requirements regarding pollinator protection which currently includes regulations for the foliar use of the neonicotinoids. This presentation will provide an update on the status of current restrictions and actions. It will also provide an update on management options that can be used to minimize the impact on pollinators. *Instructor: Ms. Joanne Whalen, University of Delaware*

has potential to improve animal comfort and health, protect winter pastures, and reduce the environmental impact of winter feeding and loafing areas. Such a woodchip-surfaced heavy use area has been installed and monitored in West Virginia. *Instructors: Mr. Tom Basden (WVU Extension); Dr. Joshua Faulkner (University of Vermont Extension)& Dr. David DeVallance (West Virginia University)*

## **V. Soil and Water Sessions**

Each Session is Worth 1 CEU in Soil and Water Management

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**Ensuring a Climate-Resilient Agriculture through Improved Soil and Water Management** - Climate projections indicate the region will experience increased precipitation and more frequent and intense storms and flooding, as well as drought periods of greater severity. These changing, and uncertain, moisture patterns and hydrologic occurrences will undoubtedly create conditions that are economically challenging for agriculture, but will also increase the likelihood of nutrient and soil loss and resulting water quality impairment. Agriculture will be, and is being, forced to adapt. Soil and water resource outreach, education, and applied research will be critical components of a successful agricultural climate adaptation approach. With improved management and innovative solutions, our agricultural landscapes can help capture excess moisture, reducing peak flows and nutrient and sediment loss, and increase water retention for use in dry periods. *Instructor: Dr. Joshua Faulkner, University of Vermont Extension*

**MDA Nutrient Management Regulations and the Phosphorus Management Tool** – This session will provide an update on PMT implementation (currently in economic review) and discuss related issues or incentives that may be available. The session will also include stream setback requirements for both animals and crops. I will outline the process for allowing flash grazing of livestock in established setback areas. We will look at winter spreading restrictions, temporary stockpiling, cost-share funding for BMPs, and the future prohibition on winter spreading. We will discuss manure incorporation and exemptions to the regulation, vertical tillage, and the relationship between no-till, vertical tillage, and soil health. I will briefly review the Annual Implementation Report form and the need for accurate and complete information as it relates to the Bay Model. We'll briefly explore the growing popularity of food waste products being land-applied to farms, the benefits and disadvantages, and the need to treat them as organic sources of nutrients that need to be included in a NM Plan. *Instructor: Mr. Dwight Dotterer, Maryland Department of Agriculture*

**Wood Chip Pad Winter Feeding Area as a New Livestock Manure Management System** - Traditional winter feeding areas, or 'sacrifice' areas, for beef cattle can be a significant source of nutrient and sediment pollution. Sustainable and affordable approaches are needed that effectively control manure nutrients during winter feeding, while ensuring a healthy and comfortable animal environment. The use of woodchips as a surface material for areas used to hold cattle during wet periods is practiced on a limited basis in Ireland, Scotland, and New Zealand. The application of this simple technology in the cool humid climates

**Getting Creative with Cover Crops as Tools for Soil Health and Nutrient Cycling** - The 2012 USDA agriculture census indicates that cover crops were used on about 2.6% of cropland in the US. Very few states had cover crops on more than 10% of their cropland, and all of those were in the NE region (or neighboring Virginia). The leading state in terms of percentage of cropland treated with cover crops was Maryland by a wide margin with 23% (counting only "traditional" cover crops). The reason for this is rather simple: Maryland public policy backed up by dollars (up to \$105/acre). The Maryland cover crops program is aimed almost entirely at reducing nutrient loading from cropland to the Chesapeake Bay. Efforts in other states without payments are focused more on soil quality and farm profitability. The most widely used cover crop is cereal rye, but others such as forage radish, triticale, and barley are becoming increasingly important. One of the most critical cover crop challenges in the region is the ability to plant cover crops early – preferably in late summer, so as to obtain significant nutrient uptake during the fall before the nitrogen is leached out of the root zone. Most current cover crops systems depend mainly on nutrient uptake in the spring when much of the excess nitrogen is already gone and accumulating cover crop biomass may delay cash crop planting. It would be beneficial to have cover crops return nitrogen fast enough to boost cash crop yields or reduce fertilizer requirements. Farmers and researchers are creating solutions with zoned multispecies cover crops, species mixtures, and alternative methods of seeding and terminating cover crops. *Instructor: Dr. Ray Weil, University of Maryland*

**Field Setback Comparison in the Mid-Atlantic and the National Setbacks Database** - A key strategy for protecting surface water quality is maintaining setback back distances between where manure is applied and sensitive features in the landscape. Regulatory requirements and NRCS recommendations for manure application setbacks vary among states. University of Missouri, with support of NRCS, has attempted to maintain a database of setback requirements and recommendations for most states in the US. The resulting database is accessible at the website [http://nmplanner.missouri.edu/software/setbacks\\_2012.asp](http://nmplanner.missouri.edu/software/setbacks_2012.asp). This session will familiarize attendees with how state-specific information is presented in our web-accessible database. Comparisons of approach for key setback features and suggestions on potential improvements to identifying setback features will be discussed. An important goal of the session is to get feedback from attendees on potential errors or misinterpretations that might be currently incorporated into the setbacks database. *Instructor: Dr. John Lory, University of Missouri*

**Informative Soil, Water, and Plant Analytical Testing** - The results of a soil test are only as good as the sample collected. The same is true for plant and water tests. Understanding the use and interpretation of soil, plant, and water tests is a key component of nutrient management -- they can be used to estimate the

contribution from the soil and irrigation water at a given field or to help diagnose a nutrient deficiency in the plant so the problem can be corrected -- and that is just from a fertility test. Physical and environmental testing have their place too! Getting meaningful numbers requires that samples are collected at the right time in the right way and that the lab doing the analysis uses appropriate methods and laboratory practices. This session will provide a refresher on the analytical process, discuss what to look for when selecting a lab, consider how testing can be used to troubleshoot problems, and provide updates on some of the new tests on the horizon. *Instructor: Dr. Karen Gartley, University of Delaware*

**Use of GIS and Data Layers in Conservation and Nutrient Management Planning** - One of the key steps in nutrient and conservation planning is accessing and organizing spatial data needed for developing a plan. University of Missouri with the support of NRCS has worked to facilitate web access to GIS tools and data layers needed for nutrient management. We maintain the Missouri Clipper site that provides spatial and supporting databases needed for nutrient management and conservation planning. We also have developed the NMTracker web GIS tool that facilitates mapping field boundaries and manure application setback features, calculating field sizes and spreadable acres for manure application, determining field soil types, and printing needed maps. This session will provide a brief demonstration of how to access and use these tools in developing a nutrient management plan. We will also discuss our vision to facilitate plan implementation and record keeping through the NMTracker website. *Instructor: Dr. John Lory, University of Missouri*

**Denitrification in Restored, Forested, and Agricultural Wetlands of the Mid-Atlantic** - The restoration of wetlands on drained agriculture fields has been performed to increase water quality and ecosystem services. A study was conducted comparing restored wetlands to forested and drained agricultural lands in Maryland, Delaware, Virginia, and North Carolina. We measured denitrification enzyme activity (DEA) across all three wetland types and four elevation classes. Results showed that restorations are similar to forested wetlands, indicating that they are moving back to a natural state. *Instructor: Dr. Jarrod Miller, University of Maryland Extension*

**Summary of Biosolids P Workshop** - Land application of municipal, industrial, and agricultural by-products is being restricted by nutrient management regulations due to their imbalances of nitrogen and phosphorus and the amounts of these nutrients required for crop growth. Biosolids (treated municipal waste water treatment sludges) are particularly vulnerable to continued land application because the application of these residuals to farmland is strictly regulated by nutrient management planning. A workshop addressing the state of the science with regards to the chemistry and availability of land-applied biosolids P and to provide recommendations on how to best manage biosolids applied to agricultural and urban lands was held on April 25, 2014. The topics included Biosolids processes and P control; Effects of regulations that are/will influence biosolids P use; Nutrient management planning for biosolids; Treatment plant

perspectives; Land application contractor perspectives; Biosolids P chemistry and fate in agricultural and urban ecosystems; Competition from manure; P site index; and Biosolids P and the Chesapeake Bay Model. The purpose of this talk will be to present the most important information from the April 25 workshop and to summarize the workshop recommendations. *Instructor: Dr. Greg Evanylo, Virginia Tech*

## **VI. Fifth Session & Tour**

CEUs for each session are provided after the abstract

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**Just What is the Root of the Problem** - This session will feature a range of plant problems using root boxes to demonstrate how various soil properties/conditions, soil insects, and disease organisms impact the development of plant roots. Participants will get to interact with the instructors and plants to determine just what is at the root of the problem presented. *Instructor: Dr. Richard Taylor and Dr. Gordon Johnson, University of Delaware (1 CEU SW)*

**Using Apps on your Smart Phone or Tablet in the Office and in the Field** - This session will review a selection of tablet and smart phone Apps related to crop production, weed, insect, and nutrient management, and general agriculture Apps ("Ag-Apps"). Calculators, ID (identification), field guides, and crop production Apps will be reviewed. Ag-Apps can assist key stakeholders in the farming decision making process. Examples on how to use Apps for making decisions will be provided during this workshop. I will be working off iPad & iPhone devices, but other Tablets are welcome. Most of the Apps described are compatible for all iPhone, iPad, and Android. I will introduce in this session several handy no-cost apps. Please, come with a tablet and/or smartphone. *Instructor: Dr. Ignacio Ciampitti, Kansas State University (1 CEU CM)*

**Diagnosing Deficiency Symptoms Among Crops** - This session will feature a range of field and vegetable crops that are exhibiting nutrient deficiencies. Participants will be instructed in some of the basics of determining which nutrient deficiency might be present in the crops based on nutrient mobility, typical nutrient deficiency symptoms, and underlying metabolic disruptions. We will then compare the observed symptoms for the range of crops with those symptoms found in web-based and book-based reference materials. *Instructors: Dr. Richard Taylor and Dr. Gordon Johnson, University of Delaware (1 CEU NM)*

**Vegetable Grafting** - In this evening hands-on session, participants will learn about vegetable grafting. Included will be information on types of vegetables commonly grafted and why they are grafted, rootstocks and rootstock selection, tool and materials needed, types of grafts, grafting procedures, and grafting/healing facilities. Examples of grafted plants will be

shown. Participants will then be able to practice grafting tomato and watermelon seedlings. *Instructors: Dr. Gordon Johnson (University of Delaware Cooperative Extension) & Dr. Rose Ogutu (Delaware State University) (1 CEU CM)*

**Controlling Seed Borne Vegetable Diseases with Hot Water and Chlorine Seed Treatments** - Bacterial canker, bacterial speck, and bacterial spot are serious diseases of fresh-market tomato, and incidence of these diseases in the region has risen in the past decade. Additionally, seed-borne bacterial diseases of other small seeded vegetable crops such as eggplant, lettuce, radish, pepper, carrot, turnip, and spinach are also a problem. The current management practices for the control of bacterial diseases in these vegetable crops are over-reliant on foliar sprays that are often ineffective, especially if seed-infestation is not eliminated. However, these vegetable seeds may be treated for most bacteria that can cause disease and are harbored either on or in the seed. One method to reduce seed transmission of bacterial diseases is to hot-water treat seed. Another method is to use chlorine (bleach) to treat seed. This session will demonstrate both methods of seed treatment. *Instructor: Dr. Kate Everts, University of Delaware and University of Maryland (1 CEU PM)*

**Bioassays for Soil Health, Soil Pests, and Herbicide Carryover** - Bioassays are useful tools for crop consultants to evaluate fields for soil health, diseases, chemical carryovers, or other potential soil or growing medium issues. Examples of bioassays used to evaluate soil health, root knot nematodes, herbicide carryover, and compost will be presented. Participants will have hands-on practice in setting up and interpreting bioassays. *Instructor: Dr. Gordon Johnson (University of Delaware Cooperative Extension) & Ms. Kristina Smith (University of Delaware) (1 CEU SW)*

### **Crop School on Wheels – Wednesday Tour**

*If you select to participate in this tour you will not be permitted to select any other sessions to attend on Wednesday. Space is limited.*

This popular event returns with the following horticultural stops scheduled. There will be a total of 8 stops as listed below plus talks on the bus route between stops providing a total of 450 minutes of training split among CM, SW, PM and NM.

1. Magee Farms, Selbyville, DE. Plasticulture strawberry production and vegetable packing.
2. Bennett's Orchard, Frankford, DE. Blueberry and peach production.
3. East Coast Perennials, Millsboro, DE. Nursery production, garden center, and landscape business.
4. Nassau Valley Vineyards, Lewes, DE. Wine grape production, vineyard management, and wine making.
5. T.S. Smith and Sons. Bridgeville, DE. Orchards, tree fruit management, alternative fruit production, vegetable production.
6. Woodland Harvest Farm. Seaford, DE. Organic vegetable production and high tunnel production.
7. Lakeside Greenhouses. Laurel, DE. Greenhouse production and floriculture.
8. Vincent Farms. Laurel, DE. Vegetable packing, produce food safety, and drip irrigation.

*Instructor: Dr. Gordon Johnson, University of Delaware Cooperative Extension (3.0 CEU = CM; 2.0 CEU = SW; 1.5 CEU = PM; 1.5 CEU = NM)*

# 2014 Crop Management School Workshop Schedule

**Tuesday, November 18, 2014**

<b>Time</b>	<b>Crop Management Palmetto 2 &amp; 3 (upstairs)</b>	<b>Nutrient Management Palmetto 4 &amp; 5 (upstairs)</b>	<b>Soil and Water Mgt. Barbados &amp; Cayman (downstairs)</b>	<b>Pest Management Dominica &amp; Eleuthera (downstairs)</b>	<b>Fifth Session Palmetto 1 (upstairs)</b>
10:00 - 10:50	Keys to Producing High Soybean Yields <i>Dr. Chad Lee</i>	Advanced P Management for Crop Production and Environmental Stewardship <i>Dr. Joshua McGrath</i>	Ensuring a Climate-Resilient Agriculture through Improved Soil and Water Management <i>Dr. Joshua Faulkner</i>	Mobile Apps for Agriculture <i>Dr. Ignacio Ciampitti</i>	Just What is the Root of the Problem <i>Dr. Richard Taylor</i>
11:00 - 11:50	Keys to Producing High Soybean Yields <i>Dr. Chad Lee</i>	Advanced P Management for Crop Production and Environmental Stewardship <i>Dr. Joshua McGrath</i>	Ensuring a Climate-Resilient Agriculture through Improved Soil and Water Management <i>Dr. Joshua Faulkner</i>	Mobile Apps for Agriculture <i>Dr. Ignacio Ciampitti</i>	Just What is the Root of the Problem <i>Dr. Richard Taylor</i>
11:50 - 1:00	<b>LUNCH BREAK</b>				
1:00 - 1:50	Intensive Wheat Management <i>Dr. Chad Lee</i>	Reading Your Land for Optimal Soil Fertility Recommendations <i>Dr. Mark Reiter</i>	MDA Nutrient Management Regulations and the Phosphorus Management Tool <i>Mr. Dwight Dotterer</i>	On Target Application Academy <i>Patricia &amp; Lloyd Hipkins</i>	Using Apps on your Smart Phone or Tablet in the Office and in the Field <i>Dr. Ignacio Ciampitti</i>
2:00 - 2:50	Intensive Wheat Management <i>Dr. Chad Lee</i>	Reading Your Land for Optimal Soil Fertility Recommendations <i>Dr. Mark Reiter</i>	MDA Nutrient Management Regulations and the Phosphorus Management Tool <i>Mr. Dwight Dotterer</i>		Using Apps on your Smart Phone or Tablet in the Office and in the Field <i>Dr. Ignacio Ciampitti</i>
2:50 - 3:10	<b>BREAK</b>				
3:10 - 4:00	Filter the Kool-Aid Before You Drink It <i>Dr. Bob Nielsen</i>	Soil Fertility and Nutrient Management of Organic Cropping Systems <i>Dr. John Spargo</i>	Wood Chip Pad Winter Feeding Area as a New Livestock Manure Management System <i>Mr. Tom Basden, Dr. Joshua Faulkner, and Dr. David DeVallance</i>	On Target Application Academy <i>Patricia &amp; Lloyd Hipkins</i>	Diagnosing Deficiency Symptoms Among Crops <i>Dr. Richard Taylor</i>
4:10 - 5:00	Filter the Kool-Aid Before You Drink It <i>Dr. Bob Nielsen</i>	Soil Fertility and Nutrient Management of Organic Cropping Systems <i>Dr. John Spargo</i>	Wood Chip Pad Winter Feeding Area as a New Livestock Manure Management System <i>Mr. Tom Basden &amp; Dr. Joshua Faulkner</i>		Diagnosing Deficiency Symptoms Among Crops <i>Dr. Richard Taylor</i>
7:30 - 8:30					Vegetable Grafting – <i>Dr. Gordon Johnson &amp; Dr. Rose Ogutu</i>

## Wednesday, November 19, 2014

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management Palmetto 4 & 5 (upstairs)	Soil and Water Mgt. Barbados & Cayman (downstairs)	Pest Management Dominica & Eleuthera (downstairs)	Fifth Session Palmetto 1 (upstairs)
8:00 - 8:50	Grain Drying and Storage Management <i>Dr. Michael Buschermohle</i>	Next Generation P Index: Meeting the Needs of Farmers, Planners and the Environment <i>Dr. Doug Beegle</i>	Getting Creative with Cover Crops as Tools for Soil Health and Nutrient Cycling <i>Dr. Ray Weil</i>	Herbicide Mechanism of Action and What it Means <i>Dr. Mark Van Gessel</i>	Tour
9:00 - 9:50	Grain Drying and Storage Management <i>Dr. Michael Buschermohle</i>	Next Generation P Index: Meeting the Needs of Farmers, Planners and the Environment <i>Dr. Doug Beegle</i>	Getting Creative with Cover Crops as Tools for Soil Health and Nutrient Cycling <i>Dr. Ray Weil</i>	Herbicide Mechanism of Action and What it Means <i>Dr. Mark Van Gessel</i>	
9:50 - 10:10	<b>BREAK</b>				
10:10 - 11:00	Precision Ag. Technologies for Crop Management <i>Dr. Bob Nielsen</i>	Land Grant University Fertilizer Recommendations: What in the World is Going on Here? <i>Dr. Brad Joern</i>	Field Setback Comparison in the Mid-Atlantic and the National Setbacks Database <i>Dr. John Lory</i>	Mycotoxins: What Are They and How Did They Get There? <i>Dr. Hillary Mehl</i>	Tour
11:10 - 12:00	Precision Ag. Technologies for Crop Management <i>Dr. Bob Nielsen</i>	Land Grant University Fertilizer Recommendations: What in the World is Going on Here? <i>Dr. Brad Joern</i>	Field Setback Comparison in the Mid-Atlantic and the National Setbacks Database <i>Dr. John Lory</i>	Mycotoxins: What Are They and How Did They Get There? <i>Dr. Hillary Mehl</i>	
12:00 - 1:00	<b>LUNCH BREAK</b>				
1:00 - 1:50	Managing Field Variability: Transitioning to Zone Management <i>Dr. Michael Buschermohle</i>	Greenseeker Algorithm Development for the Mid-Atlantic <i>Dr. Steve Phillips</i>	Informative Soil, Water, and Plant Analytical Testing <i>Dr. Karen Gartley</i>	Viruses in Agronomic Crops <i>Dr. Nathan Kleczewski</i>	Tour
2:00 - 2:50	Managing Field Variability: Transitioning to Zone Management <i>Dr. Michael Buschermohle</i>	Greenseeker Algorithm Development for the Mid-Atlantic <i>Dr. Steve Phillips</i>	Informative Soil, Water, and Plant Analytical Testing <i>Dr. Karen Gartley</i>	Viruses in Agronomic Crops <i>Dr. Nathan Kleczewski</i>	Tour
2:50 - 3:10	<b>BREAK</b>				

## Wednesday, November 19, 2014 (Continued)

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management Palmetto 4 & 5 (upstairs)	Soil and Water Mgt. Barbados & Cayman (downstairs)	Pest Management Dominica & Eleuthera (downstairs)	Fifth Session Palmetto 1 (upstairs)
3:10 - 4:00	Identifying and Interpreting Data Sources for Precision Agriculture <i>Mr. Tim Woodward</i>	Corn Nitrogen Management: Can We Make Better In-season Decisions with a Model? <i>Dr. Brad Joern</i>	Use of GIS and Data Layers in Conservation and Nutrient Management Planning <i>Dr. John Lory</i>	How to Best Use Neonicotinoid Insecticides In Vegetable and Field Crops to Minimize Impact on Pollinators <i>Ms. Joanne Whalen</i>	Tour
4:10 - 5:00	Identifying and Interpreting Data Sources for Precision Agriculture <i>Mr. Tim Woodward</i>	Corn Nitrogen Management: Can We Make Better In-season Decisions with a Model? <i>Dr. Brad Joern</i>	Use of GIS and Data Layers in Conservation and Nutrient Management Planning <i>Dr. John Lory</i>	How to Best Use Neonicotinoid Insecticides In Vegetable and Field Crops to Minimize Impact on Pollinators <i>Ms. Joanne Whalen</i>	Tour

## Thursday, November 20, 2014

Time	Crop Management Palmetto 2 & 3 (upstairs)	Nutrient Management I Palmetto 4 & 5 (upstairs)	Nutrient Management II Barbados & Cayman (downstairs)	Soil and Water Mgt. Dominica & Eleuthera (downstairs)	Fifth Session Palmetto 1 (upstairs)
8:00 - 8:50	The Role of Small Unmanned Aerial Systems in Agriculture <i>Mr. Tim Woodward</i>	Vegetable Crop Nutrition for the Mid-Atlantic <i>Dr. Gordon Johnson</i>	The Science and Practicality of Wheat Nitrogen Management <i>Dr. Bob Kratochvil</i>	Denitrification in Restored, Forested, and Agricultural Wetlands of the Mid-Atlantic <i>Dr. Jarrod Miller</i>	Controlling Seed Borne Vegetable Diseases with Hot Water and Chlorine Seed Treatments <i>Dr. Kate Everts</i>
9:00 - 9:50	The Role of Small Unmanned Aerial Systems in Agriculture <i>Mr. Tim Woodward</i>	Vegetable Crop Nutrition for the Mid-Atlantic <i>Dr. Gordon Johnson</i>	The Science and Practicality of Wheat Nitrogen Management <i>Dr. Bob Kratochvil</i>	Denitrification in Restored, Forested, and Agricultural Wetlands of the Mid-Atlantic <i>Dr. Jarrod Miller</i>	Controlling Seed Borne Vegetable Diseases with Hot Water and Chlorine Seed Treatments <i>Dr. Kate Everts</i>
9:50 - 10:10	<b>BREAK</b>				
10:10 - 11:00	Grain Sorghum Production Tips for the Mid-Atlantic <i>Dr. Maria Balota</i>	Implementing the Mid- Atlantic Corn and Wheat Algorithms for GreenSeeker <i>Dr. Wade Thomason</i>	Enhanced Efficiency Nitrogen Management in Conservation Tillage Systems <i>Dr. William Hunter Frame</i>	Summary of Biosolids P Workshop <i>Dr. Greg Evanylo</i>	Bioassays for Soil Health, Soil Pests, and Herbicide Carryover <i>Dr. Gordon Johnson &amp; Ms. Kristina Smith</i>
11:10 - 12:00	Grain Sorghum Production Tips for the Mid-Atlantic <i>Dr. Maria Balota</i>	Implementing the Mid- Atlantic Corn and Wheat Algorithms for GreenSeeker <i>Dr. Wade Thomason</i>	Enhanced Efficiency Nitrogen Management in Conservation Tillage Systems <i>Dr. William Hunter Frame</i>	Summary of Biosolids P Workshop <i>Dr. Greg Evanylo</i>	Bioassays for Soil Health, Soil Pests, and Herbicide Carryover <i>Dr. Gordon Johnson &amp; Ms. Kristina Smithkhedge</i>



# ***Mid-Atlantic Crop Management School 2014 Planning Committee***

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Dr. Josh McGrath and Dr. Bob Kratochvil – University of Maryland

## **Program Chairs / Co-Chairs**

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Dr. Cory Whaley – University of Delaware  
Dr. Richard Taylor – University of Delaware

### **Nutrient Management**

Dr. Amy Shober – University of Delaware

### **Pest Management**

Mr. Bill Cissel – University of Delaware

### **Soil and Water Management**

Ms. Jennifer Volk – University of Delaware  
Mr. Chris Gross – USDA NRCS  
Mr. Tom Basden – West Virginia University

### **5<sup>th</sup> Session and Tour**

Dr. Gordon Johnson – University of Delaware

## **Facilities Coordinator**

Dr. Ron Ritter – University of Maryland  
Mr. Joe Hatton – West Virginia Soil Conservation Agency

## **Recording Coordinator**

Mr. Craig Yohn – University of Maryland

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Dr. Jarrod Miller – University of Maryland  
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Dr. Nathan Kleczewski – University of Delaware  
Mr. Philip Sylvester – University of Delaware  
Mr. Sudeep Mathew – University of Maryland  
Mr. Tim Pilkowski – USDA NRCS (Maryland)  
Mr. Isaac Wolford – USDA NRCS (West Virginia)



# ***Mid-Atlantic Crop Management School***

*November 18-20, 2014*

*Princess Royale Hotel and Conference Center, Ocean City, MD*

Sponsored by the University of Maryland, University of Delaware, 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).

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