2017-2018 FUNDING REPORT







#### FROM THE PRESIDENT . . . . JENNIE SCHMIDT

We are confident that agricultural producers and agribusinesses will rise to the challenge of providing food, fiber and energy

products for the projected world population of 9.7 billion by 2050, 2.4 billion over today's population. This growth opens the door for opportunities to innovate and grow our markets. As farmers, we invest in our future through the Maryland Grain Checkoff Program, where our dollars go further by working together.

Farmers have long accepted the important role that scientific research plays in improving the way we farm. Corn yields have increased 430% since 1950 while nutrient inputs significantly decreased. Wheat jumped from 71.3 million bushels in 1950 to over one billion bushels today, grown on 24% fewer acres. This is made possible through genetics, improved placement and timing of nutrients, and more efficient agrichemical use based on recommendations from proven scientific research. This work continues as Maryland grain farmers fund research in search of science-based solutions to improve production while protecting our resources.

Research funded by MGPUB has proven that malting barley can be successfully grown in Maryland and provide another revenue stream for farmers as the demand grows within the craft breweries sector. In August, the Board of Directors visited Proximity Malt in Laurel, Delaware, a new potential buyer of malting barley, to discuss their needs with management and production control staff.

As domestic markets are saturated and international markets are being tested with trade agreement negotiations, funding our national commodity organizations is proving of great value. Their teams of knowledgeable professionals work to protect our grain interests to ensure a level playing field in trade discussions and to open and expand markets for our products across the globe.

Education projects this year are targeted at youth in hopes of building interest in an agriculture-related profession and gaining a general understanding of the industry. We also remain the primary funder of MPT's Maryland Farm and Harvest to inform consumers about our Maryland farmers.

Importantly, we would like farmers to be fully aware that our grain organizations are prepared to help them succeed. Consider contacting our office to signup for our biweekly e-newsletter to gain timely information on the latest issues and research results.

We are thankful for the continued strong encouragement and financial support we have received from growers through the Maryland Grain Checkoff Program. We trust that you will see depicted in the pages of this report the image of an organization focused on its mission, dedicated to the purposes it extols, and true to its beliefs.

Our goal is simple. We strive to address the needs of growers by funding projects that will provide advancements in research, marketing and education so farming in Maryland is productive, prosperous and responsibly using our resources.



The MARYLAND GRAIN PRODUCERS UTILIZATION BOARD implements the Maryland Grain Checkoff Program, collecting funds and providing grants focused on market development, research and education for the collective benefit of Maryland farmers.



Farm visits of foreign delegations provide the opportunity to see the quality of Maryland grain and the care of the farmer in growing the crop. These visits build trust and expand markets globally.

# **GROWING THE CORN INDUSTRY**National Corn Growers Association www.ncga.com

The National Corn Growers Association (NCGA) and its state corn organizations and powerful grassroots worked tirelessly sharing positive messages about corn, food, farming, ethanol, biotechnology, conservation practices, sustainability and other key issues this year. With a continuous news cycle driven by those who know little about farming and food production, the farmerdriven, farmer-first messaging matters a lot. In the last decade, ethanol production has increased by 15 billion gallons. Those 15 billion gallons of renewable fuel have meant much to rural America: good jobs, revenue, schools, growing corn markets, less reliance on foreign oil, cleaner air, research and considerable investment. There is room to fuel more of today's vehicles while preparing to fuel tomorrow's super-efficient vehicles the auto industry is designing. Recognizing this, corn growers have jumped in and are making major investments to change how to fuel America. Rhetoric from Washington has shown that trade is an issue where grower involvement has become critical. NCGA and state associations have conducted trade schools, hosted key foreign delegations and worked hard to educate leaders on the importance of trade to rural America. NCGA is delivering the message that free, fair and open trade is beneficial for U.S. agriculture. 2017 Funding \$230,000, 2018 Grant \$230,000

Chip Bowling, past national chair, represents Maryland at NCGA.

# EXPANDING TRADE, EXPANDING OPPORTUNITIES

US Grains Council | www.grains.org

The U.S. Grains Council builds relationships to increase exports. Through its customer servicing programs, the Council provides timely market information to Taiwanese grain buyers that bolsters strong and increasing market share. The Council's efforts focus on differentiating U.S. grain from competitors and sharing the experiences of loyal U.S. grain users with others in the local industry. The information provided includes insight on the production, supply and demand, quality, grading, inspection, shipment, applications, etc. of U.S. corn, grain sorghum, barley and their coproducts. This includes participation in teams, seminars, panel discussions and meetings as well as data transmitted through publications and a local website. Working to create a strong return of U.S.

corn exports to the Algerian Market, the Council hosted a workshop in Algiers to promote U.S. corn. Algerian importers were invited to the Council's Regional U.S. Corn Crop Quality Report Conference in Casablanca. An Algerian trade team was hosted in the United States to participate in a grain buyers training course, visit farms and meet with state associations. As a result of these promotion efforts, Algerian importers returned to buying U.S. corn, importing 670,000 metric tons valued at \$117 million. This is almost a threefold increase of U.S. corn exports to Algeria. State partnerships are more important than ever in keeping American agriculture the world's most reliable, trusted partner in "developing markets, enabling trade and improving lives." 2017 Funding \$75,000, 2018 Grant \$75,000

Chip Councell represents Maryland and served as the Council's 2017 chair.

# **ETHANOL MARKETING AND INFRASTRUCTURE DEVELOPMENT**Sustainable Energy Strategies, Inc. | www.sesi-online.com

Sustainable Energy Strategies, Inc. (SESI) coordinated the 2017 Biofuels Infrastructure Grant Project (BIP). Maryland saw the addition of seven E15/E85 stations and 36 dispensers. The advertising campaign reached approximately 22 million, attracting 170,000 visits to www.DriveFlexFuels.org. The video campaign generated 1,710 clicks, with more than 100,000 individuals viewing 100% of the MGPUB-sponsored ethanol videos. The radio campaign was heard an estimated 19 million times throughout the DC metro region. Postcards were sent to 23,500 flex fuel vehicle owners near E85 stations. The stations realized a nearly 25% increase (315,000 E85 gallons) in sales at the 16 Protec stations following the advertising campaign, with Protec selling a total of 1.3 million E85 gallons. Tri-Gas & Oil sold an additional 500,000 gallons. This increase is equivalent to about 100,000 additional bushels of corn per year. By comparison, Virginia Sheetz' 12 stations in the BIP grant saw 400% increase in E15, and their E85 volume doubled over the year and quadrupled over the past two years. Sheetz' E15 volumes hit one million gallons, and E85 hit 898,000 gallons. This is equivalent to an increased demand for about 374,000 bushels of corn per year. SESI completed four educational and outreach events, reaching more than 35,000 people. The company helped secure an additional \$210,000 in state grant funding for Protec stations with overall project costs over \$2.1 million. Further, SESI assisted in securing an additional \$800,000 for VA/MD stations, to build the ethanol market and increase corn use. 2017 Funding \$27,634, 2018 Grant \$26,903.65

# DEVELOPING EXPORT MARKETS FOR MARYLAND'S WHEAT PRODUCERS

US Wheat Associates www.uswheat.org

U.S. Wheat Associates (USW) is the only organization promoting Maryland's soft red winter (SRW) wheat in overseas markets. State funding helps USW qualify for federal funds and promote the unique benefits of SRW wheat for growing snack and pastry markets in Latin America, the Middle East and North Africa. Though abundant supplies of wheat in other exporting countries and other market factors pressured SRW wheat exports in 2017, USW activities help increase sales to several Caribbean and Central American countries. For example, USW introduced

a new testing method that demonstrates SRW wheat's superior performance in a crop quality webinar. A cake baking technology short course in Egypt for Middle Eastern and North African private millers and bakers provided a positive base of knowledge for SRW wheat in a growing category. Maryland's grant directly supports USW's efforts to increase export market development program funding, advocate for staying in NAFTA to improve the agreement, pursue an aggressive free trade agenda, and support for World Trade Organization cases against trade distorting Chinese policies that hurt U.S. farmers. 2017 Funding \$56,100, 2018 Grant \$55,000

Jason Scott, 2017 national chair, represents Maryland at USW..

# **PROMOTING FAVORABLE WHEAT POLICY**National Association of Wheat Growers | www.wheatworld.org

Working on behalf of state wheat associations on federal farm policy made 2017 a very busy fiscal year for the National Association of Wheat Growers (NAWG). Wheat continues to have a seat at the table in development of the 2018 Farm Bill and has been at the forefront of important debates on issues including agriculture appropriations, environmental regulations, tax reform, federal trade policy, the regulatory framework for new breeding technologies, and many others. NAWG's efforts led to several key wheat research programs receiving funding increases in the FY 2017 agriculture appropriations bill. Key priorities for the Farm Bill include maintaining a strong crop insurance program, improving Agriculture Risk Coverage and Price Loss Coverage, including increasing the wheat reference price, doubling funding for the Market Access Program and Foreign Market Development program, and prioritizing working lands conservation programs. NAWG's Foundation conducted leadership training programs for member states' up and coming directors. NAWG also has continued to work with its states to ramp up communications activities. These efforts will continue through the upcoming year. 2017 Funding \$11,000, 2018 Grant \$13,000

Eric Spates represents Maryland on the NAWG board.

## GROWING OPPORTUNITIES IN BARLEY

National Barley Growers Association www.nationalbarley.com

The National Barley Growers Association (NBGA) represents the interests of barley growers in the areas of farm policy, crop insurance, trade, industry relations, and biotechnology. NBGA is working to achieve results for Maryland barley growers in the following areas: pressing the Administration to continue participation in the North American Free Trade Agreement, petitioning Congress for barley priorities in the 2018 Farm Bill and passage of the legislation prior to AA14's expiration September 30, 2018, expanding relationships with Congressional staff (via the Barley, Boots, and Brews reception

on Capitol Hill, which is inclusive of industry stakeholders), hosting a Barley Industry Leaders of Tomorrow "AgVocate" all day training session in Washington, DC prior to the NBGA Board of Director's winter meeting. NBGA continues to participate in sustainability through membership of Field to Market and finalizing barley sustainability metrics, barley acreage stabilization, and support for sustaining \$2 million in additional funding for the Wheat and Barley Scab Initiative. NBGA will also continue to work at expanding member participation and growing industry participation in the Association. 2017 Funding \$1,987, 2018 Grant \$1,992

Jennie Schmidt is the Maryland representative to NBGA.

# INVESTIGATING OPPORTUNITIES FOR MARYLAND FARMERS IN CUBA MD Agricultural Associates

In 2000, the Trade Sanctions Reform and Export Enhancement Act was passed to lift the ban on agricultural trade with Cuba, which had been restricted since the Cuban missile crisis in 1962. Of significant interest to Maryland grain farmers is the export of poultry and grain, with Cuba being the eighth largest export market for U.S. poultry. Cuba is only about 20% self-sufficient in food production for its 11 million population. Meetings were held with government officials, Cuban farmers and others to investigate opportunities. Significant limits to trade need Congressional action. One barrier is that American banks cannot do business directly with Cuba and therefore foreign banks are used to receive payment for American agricultural purchases. Ships delivering goods to Cuba cannot return to U.S. waters for 180 days. These restrictions make the cost of doing business in Cuba more expensive and complicated than for other countries. Another large barrier under the current communist government is that there is only one trading entity, Alimport, for U.S. agricultural goods. Cuban farmers were generally very willing to discuss their farming operations. They grow crops without chemical inputs and limited mechanical and technological inputs. The outcome has been an agricultural production system using mostly organic products on small acreages, such as the use of predators and organic substances for insect control, weed control using hand cultivation, and fertilizer production through composting. Cubans have many needs that could be provided by U.S. goods and services. Congressional action and presidential support will be required to open the opportunity for Maryland grain farmers to benefit from this expanded market, just 90 miles from U.S. soil. 2017 Funding \$2,500



Research is fundamental to the growth of the Maryland grain industry as new products and practices are developed to increase production while protecting our valuable land and water resources.

# MONITORING FIELD LEVEL GROUNDWATER QUALITY IN THE UPPER CHESTER SHOWCASE WATERSHED

U.S. Geological Survey www.usgs.gov

The purpose of this project was to study the transport of nitrate to groundwater under irrigated and dryland corn and soybean production. Nitrate transport through the soil zone to groundwater was observed in soil water beneath both fields but was greatest beneath the irrigated field. Highest nitrate concentrations were seen in soil water collected shortly after application of fertilizer to the corn crop at the beginning of the growing season. Nitrate concentrations over 50 mg/L as nitrogen were measured in soil water at the 3-ft depth beneath the irrigated field, which is at a level below most root-zone activity where nitrate is most likely to be available for transport to groundwater; similar high concentrations were not measured at the 3-ft depth beneath the dryland field. Shallow groundwater samples collected over the study period showed a slight increase in median nitrate concentrations over time beneath the irrigated field, but not beneath the dryland field. These patterns seem to indicate greater potential for chemical transport to groundwater beneath the irrigated field compared to the dryland field. Results of this project are intended to provide information useful to farmers and agricultural conservationists interested in the best utilization of applied nutrients. 2017 Funding \$8,000

# EXPANDING BARLEY AND RYE PRODUCTION FOR THE CRAFT BEVERAGE INDUSTRIES

Grow & Fortify, LLC www.growandfortify.com

The goal of this project was to determine if malting barley commercially is a viable and potentially profitable enterprise for Maryland growers. Management included: fall herbicide with the Barley (Scala, SY Tepee, and Thoroughbred) being planted October 6, 2016, and harvested June 13, 2017, and spring barley (AAC Synergy) was planted March 9, 2017, and harvested July 7, 2017 at the Western Maryland Research Education Center. Blocks were four acres and planted at 2.2 bushels/acre, 106 lbs., ~1.7 m seed drop. Fertility

and pests were managed judiciously, with 30-52-100 lbs. at planting and 50 lbs. of nitrogen on February 24, 2017. Spring barley was fertilized with 80 lbs. nitrogen on March 24, 2017. Caramba was applied at 12 oz. in 20 gallons of water/acre, and Warrior for cereal leaf beetle, in the fall barley on April 28, 2017. Samples were sent to the Michigan State Grain Testing lab straight out of the combine and after cleaning. Directly out of the combine, none of the varieties met the required quality standards. Local barley prices were \$4.25 per bushel delivered to Laurel, Delaware. Production costs were about \$3.00 per acre, plus \$.16 handling and \$.60 per bushel transportation costs. Averaging 60 bushels per acre, profit would be \$29.40 per acre. 2017 Funding \$2,000

# IMPROVEMENT AND DEVELOPMENT OF BARLEY FOR USE IN FEED, MALT AND FUEL

VA Polytech Institute www.pubs.evt.vt.edu

The Virginia Tech barley breeding program is primarily focused on development and improvement of superior, widely adapted, high yielding winter barley cultivars and the incorporation of value added traits geared towards development of new markets. As interest continues to grow in locally produced ingredients from the craft brewing industry in the Mid-Atlantic and eastern U.S., finding malted barley is not easy for those located east of the Mississippi River. Development of Double Haploid (DH) malting barley lines in collaboration with Oregon State University has recently begun. Current results are encouraging since DHs allows development of cultivars much faster than traditional methods. The DH lines are genetically pure, eliminating approximately 2-3 years of the total time required to develop a variety. Besides development and testing of experimental lines, the program also collaborates with other breeding programs, allowing evaluation of cultivars developed by collaborators across the country as well as cultivars from around the world, especially Europe. Meanwhile, in the 2017-2018 season, an Eastern Mid-Atlantic Malt Barley Trial (EMBT) was initiated with neighboring states to facilitate collaborations and enhance cultivar development. The EMBT currently includes 44 elite malt barley lines and check varieties. Molecular markers are being developed for malting quality traits to help with the selection of superior quality malting lines with more precision and elimination of costly testing expenses. Additionally, flavor analysis of commonly grown cultivars is being done to determine how malt flavor is affected by genetics and environment. There is anticipation that the production of malting barley will continue to grow in this region and that the release of cultivars will meet diverse market demands. 2017 Funding \$5,000, 2018 Grant \$5,000

# UNIVERSITY OF MARYLAND RECOMMENDATIONS: MALTING BARLEY PRODUCTION PRACTICES FOR YIELD AND QUALITY

- Choose a two-row variety that has good yield potential, strong disease resistance, and quality characteristics that meet local malt industry standards. Planting date for malting barley should be between September 20 and October 10. This will support good stand establishment and fall growth and development.
- Seeding rate should be for the establishment of at least 1.5 million plants/acre. To attain that goal, adjust seeding rate per seed lot germination percentage and calibrate the planter to assure delivery of the desired number of seeds/acre.
- For Maryland producers, apply fall nitrogen (N) per the recommendation of the fall soil nitrate test (FSNT). When FSNT is less than 15 ppm, use 30 lb. fall N/acre at planting.
- Apply spring nitrogen (N) using split applications with the first N application March 1 or as soon as possible after then. During warmer winters, the Maryland Department of Agriculture (MDA) often allows spring N application as early as February 15. Monitor winter weather and know what MDA will allow. The second spring N application is when the crop enters the jointing stage of development, generally between March 20 and April 10.
- Spring nitrogen (N) rate should be 80–90 lbs. N/acre. This is the amount of N calculated by data from this research to be the economic optimum rate. It will support attaining optimum yield while meeting the current industry standard of ≤12% protein content. Be cautious about supplying N to the crop after it reaches the boot stage, as this may result in a protein content above 12% and be subject to price penalty.
- It is the University of Maryland Extension recommendation for malting barley production to use a fungicide for protection against Fusarium Head Blight. This practice can provide benefits beyond the reduction of DON concentration. It may provide slightly higher test weight and improve the amount of plump kernels. Fungicide application should occur within five days after first appearance of the awns above the flag leaf and as the head is starting to split the boot. Research is occurring during 2017-2018 to investigate further the optimum time of application. A new product from Syngenta that supports a wider window of application is included in this research.
- Delay in harvest may cause the crop to experience rain events that can cause pre-harvest sprouting and deterioration of quality to the point where it may be rejected. To ensure attaining quality malting barley, be prepared to harvest the crop when it is ready. Moisture content of harvested grain should be approximately 14%. It may be appropriate to harvest at a moisture content higher than 14% and dry the grain. If this is planned, do not use a drying temperature greater than 110° F as temperatures greater than this will reduce seed germination.
- Adjust the combine threshing mechanism to be as gentle as possible to minimize kernel damage during harvest. Too many damaged kernels may result in rejection of the barley.

# EVALUATION OF WINTER MALTING BARLEY VARIETIES AND PRODUCTION PRACTICES FOR YIELD AND QUALITY

University of Maryland, Plant Science www.psla.umd.edu/extension/md-crops

Interest in local malting barley production to generate feedstock for the rapidly growing, local craft brewing industry has grown. This project had two objectives: first, local field evaluation of the winter malting barley varieties and elite breeding lines in the National Winter Malting Barley Variety Test; and second, evaluation of fungicide and nitrogen management practices needed to attain quality winter malting barley. The 2016-2017 Variety Test had 30 varieties and elite breeding lines submitted from breeding programs across the country and internationally. Entries were evaluated for important agronomic and malting characteristics. Three winter malting barley varieties at two Maryland locations were also tested for their response to spring nitrogen rates and fungicide use for foliar diseases and Fusarium head blight. After two years of participation in the Variety Test, there is substantial evidence that local production of winter malting barley is feasible. Two winter malting barley varieties currently favored by the local industry, Violetta and Calypso (both two row types), have performed comparable to the top check varieties in the study. Thoroughbred, a popular six-row feed barley variety grown in the Delmarva region, is a recommended winter variety by the American Malting Barley Association that also had good performance in the Maryland tests.

The University of Maryland plans to continue its participation in the Variety Test. Interest in local malting barley production is spawned by the existing 63 Maryland craft breweries plus the 29 planning to open soon. To meet the malted barley demand, the large malting company, Proximity Malt, has built a malt house near Laurel, Delaware and has contracted with growers for 2017-2018 production. Proximity anticipates their demand for locally produced malting barley to grow beyond the 2018 contracted acres. In addition to Proximity, two small craft malt houses are operating near Baltimore. Research results have helped identify production management practices to help farmers produce a high yielding, profitable malt barley crop to meet the quality standards established by the local malt industry. 2017 Funding \$6,718

# EVALUATION OF POULTRY LITTER USE ON SOILS WITH HIGH PHOSPHORUS CONCENTRATION

University of Delaware | www.ude.edu

The University of Maryland phosphorus (P) drawdown plots were maintained through 2017. In 2015, forage plots were converted to grain cropping (corn/soybean rotation) to allow for evaluation of starter P applications to corn on high P soils. In 2017, soybean was planted and no P treatments were applied in 2017. Corn was grown in 2015 and 2016 following starter P applications. Overall, results to-date do not support the use of starter P fertilizers for corn production on high P soils. Starter fertilizers will be applied prior to corn planting in 2018 to provide additional data to confirm these results due to potential impacts of weather and other factors on crop yield. Soil test P drawdown will continue to be monitored to confirm if the predicted drawdown rates (based on mathematical relationships from 2001 through 2015) are accurate. Plant tissue and soil samples from the grain drawdown plots were analyzed in 2017 as part of this continued monitoring effort. 2017 Funding \$10,040, 2018 Grant \$10,410

# REPEATED USE OF NEONICOTINOID INSECTICIDE TREATED SEED IN GRAIN CROP ROTATIONS

University of Maryland, Plant Science www.hambylab.weebly.com

Neonicotinoid seed treatments (NSTs) are insecticides commonly applied to the seed in grain crops. They provide protection against early season insect pests to improve yield when pest pressure is high. Neonicotinoids have low mammalian toxicity, but can impact non-target organisms, including beneficial arthropods and soil microbes. The effects of NSTs on pest and beneficial insects, along with plant growth parameters and yield, were studied. Cruiser® (thiamethoxam) and Gaucho® (imidacloprid), were evaluated in a rotation of full-season soybean, winter wheat, double cropped soybean and corn from 2015-2017. Based on visual scouting, NSTs provided early season pest suppression, but reduced beneficials in soybeans. Pest pressure was consistently low, and NSTs did not improve yield for any crops. Winter annual flowers growing within the plots were analyzed and did not contain significant neonicotinoid residues, so not a source of exposure for pollinators. To be determined are the impact of NSTs on the overall arthropod and soil microbial communities. Based on the study results, NSTs use did not have economic benefit in soybean, corn and wheat with low insect pest pressure. 2017 Funding \$18,000

#### VARIETY DEVELOPMENT AND TESTING OF SMALL GRAINS FOR HIGHER YIELDS, SCAB RESISTANCE, REDUCED DISEASE INCIDENCE, HARVESTABILITY, MILLING AND BAKING QUALITY University of Maryland, Plant Science www.psla.umd.edu/extension/md-crops

Lines that are on an accelerated release schedule for commercialization are four with high yield potential and excellent scab resistance to Limagrain Cereal Seeds: 15MW134, 15MW64134, 15MW315, 15 MDX19. Three elite wheat breeding lines are undergoing final testing. An inoculated and misted scab nursery was performed to measure the fusarium resistance of all 57 wheat lines in the statewide variety trials. Statewide evaluation using 57 commercial wheat lines in a total number of 1,026

plots at six locations within Maryland was conducted. Selection of the highest yielding varieties versus average performers resulted in a yield gain of 7.7 bushel/acre. The top yielder had an average statewide yield of 82.4 bushel/acre, while the lowest yielding variety averaged 68.2 bushel/acre. Breeders collaborated in three uniform wheat nursery trials and two uniform barley nursery trials, planting 529 total plots for evaluation of new germplasm under Maryland's conditions during 2016-17. For 2017-18, 80 wheat, 150 barley, and 100 triticale head rows have been planted for initial field phenotype observation. In addition, State Trial of 66 wheat lines and 8 barley lines for a total of 1,236 plots were planted to collect data on yield, test weight, maturity, height, & lodging. 2017 Funding \$16,000, 2018 Grant \$16,000

# OYSTER RESTORATION IN THE CHESAPEAKE BAY FOR ENVIRONMENTAL BENEFITS

Oyster Recovery Partnership | www.oysterrecovery.org

The Oyster Recovery Partnership deployed juvenile oysters onto one reef in the Little Choptank River with this grant during the 2017 calendar year. Oyster restoration enhances the Chesapeake Bay's oyster population, which provides vital water column filtering as well as habitat for reef-associated fishes, crabs, mussels, and other marine life. The Little Choptank River is one of the tributaries included in the Ten Tributaries by 2025 program, which stems from an oyster goal in the 2014 Chesapeake Bay Watershed Agreement. 2017 Funding \$10,000, 2018 Grant \$10,000



Dale Morris was honored by the Maryland Grain Producers Association (MGPA) with the prestigious Dr. James R. Miller award for his contribution to the grain industry and outstanding service to farmers for seed work. Kevin Anderson (right), MGPA past president, presented the award to Dale at the 2017 Maryland Commodity Classic.

# SOIL TEST PHOSPHOROUS AND SORPTION CAPACITY FOLLOWING APPLICATION OF POULTRY LITTER AND COMMERCIAL FERTILIZERS University of Delaware www.udel.edu

Field sites receiving long-term applications of manure and/or inorganic phosphorus (P) fertilizer at Georgetown, DE and Chestertown, MD were maintained through 2017. Soybean was planted in 2017 and no P treatments were applied in 2017. Soybean yields for plots receiving four or six ton/acre poultry litter and the high fertilizer were higher than for soils receiving no P at the Georgetown site; P application had no effect on yields at the Chestertown farms. Routine soil samples from 2016 showed increases in soil test P

following two applications of poultry litter at increased rates (2014 and 2016), with the highest rates of manure exceeding the 150 FIV threshold that triggers P risk assessment. There was a trend for increasing soil test P since 2014 for plots receiving all manure rates. However, preliminary analysis of historical data suggests that soil test P can be reduced by cropping over time when total P applied is less than P removal, even when soil test P is within or above the agronomic optimum. The plan is to continue maintenance of these historic sites to provide Maryland farmers with better information about the chemistry and fate of P in soils with a long-term history of manure or fertilizer applications. 2017 Funding \$5,000, 2018 Grant \$3,750

#### **EVALUATION OF NITROGEN RATE AND FUNGICIDE USE** ON WHEAT YIELD AND QUALITY

University of Maryland, Plant Science | www.psla.umd.edu/extension/md-crops

Production of high-yielding wheat with quality standards desired by the milling and baking industries has become more challenging. Wheat producers are looking for ways to produce high-yielding wheat with the quality parameters deemed important by the milling and baking industries, maximize profits, and avoid penalties at the grain elevator. This research investigated the effects that nitrogen and fungicide management had on wheat yield and quality. This project had two objectives, first, evaluate the influence of spring nitrogen rates, and second, use of a protective fungicide to manage Fusarium head blight (FHB) on the yield and quality of commonly grown soft red winter wheat varieties. The following summarizes the results from two years of field studies.

When selecting a wheat variety or varieties, in addition to high yield potential, seek information about disease resistance emphasizing FHB resistance or susceptibility;

Risk for FHB infection at heading was high both study years. The two varieties used in the study with good FHB resistance ratings had 85% (2016) and 55% (2017) lower vomitoxin (DON) concentrations than the susceptible variety, Shirley that had 1.67 ppm and 2.45 ppm DON during 2016 and 2017, respectively. The use of FHB fungicide for the resistant varieties reduced DON concentrations an average of 33% during the two years, while the reduction in DON concentrations for the susceptible variety, Shirley, averaged 55%.

Farmers should be prepared to use an FHB protective fungicide when risk for FHB infection is high. Fusarium head blight risk is monitored during the season at www.wheatscab.psu.edu.

Many farmers are estimating the amount of spring nitrogen (N) needed for wheat by the yield goal method. Currently, the calculation of N rate with this method uses 1 lb. N/bushel yield goal. Yield response to a range of nitrogen rates in this research indicated that optimum yield likely occurs if the N rate is greater (1.2-1.25 lb. N/ bushel yield goal). Additional research including on-farm strip trials is needed to verify this outcome. Test weight for FHB resistant varieties researched showed no improvement when a protective fungicide was used. However, test weight for the FHB susceptible variety, Shirley, improved 8% when protective fungicide was used. Nitrogen rate had no effect on test weight. Protein content steadily increased as nitrogen rate increased for all varieties used in this study (10.75% to 13.1% from the no nitrogen check to 150 lb. N/acre high rate, respectively). Fungicide use did not influence protein content. 2017 Funding \$13,665

#### **DETERMINING THE IDEAL IRRIGATION STRATEGY FOR HIGH** INTENSITY CORN PRODUCTION

University of Delaware www.extension.udel.edu/ag/ irrigation/

Each of the five years of this study demonstrated different trends regarding the best method to schedule pivot irrigation. 2013 tended to show that the wetter treatments performed best; in 2014, there was no need to irrigate as the dryland yields were not significantly lower than irrigated; in 2015, the yields were good as long as some irrigation was provided; and in 2016, irrigated treatments were similar and only slightly higher than the dryland treatment. 2017

showed that rainfall and irrigation were not the limiting factor for yield for this growing season. In 2017, there was very little separation in yield between any irrigated treatment where yields ranged from 204 to 215 bushels/acre. Contrary to previous results, the only irrigated treatment with a yield drag was the sensor triggered 30cb, which also received the most irrigation. There was no statistical difference between the ET triggered plots that received half the water and the full rate, again indicating that yields were not limited by water. Additional work on population, maturity range and planting date also play a major part in creating irrigated yield differences. 2017 Funding \$22,720



Congratulations to Drew Haines from Middletown, who placed second nationally in the Non-Irrigated Division of the Corn Yield Contest. DEKALB DKC62-20RIB brought him a winning yield of 341.6354 bushels per acre.

#### **MARYLAND WINNERS**

**Producer** Yield/Hybrid

#### IRRIGATED

Bruce Bartz 331.4927 Denton DKC62-08RIB

Michael Bostic 292.0242 Church Hill P1870AM™

Marion Wilson 274.0743 Centreville DKC64-35RIB

#### NON-IRRIGATED

Drew Haines 341.6354 Middletown DKC62-20RIB

Tom Walsh 288.2975 Hampstead P1197AM<sup>™</sup>

Bruce Bartz 286.5442 Denton DKC63-33RIB

John Rigdon 280.0704

Jarrettsville DKC62-08

#### **NO-TILL / STRIP TILL IRRIGATED**

Michael Bostic 289.1469 Church Hill P1870AM™

John Saathoff 279.6711 Ridgely P1197AM<sup>™</sup>

William Layton 279.6401 Vienna DKC65-20

#### **NO-TILL / STRIP-TILL NON-IRRIGATED**

Brenda Walsh

288.0024 Hampstead A6499 STXRIB

William Willard 279.8398 Poolesville DKC64-35RIB

Brad Rill 277.2654 Hampstead A6499 STX



Building a community that appreciates the work and understands the challenges of farming creates a more supportive environment for farmers. Our education projects take on a variety of audiences in multiple settings to achieve a more knowledgeable community and build interest in young people to pursue agricultural careers.

#### **MARYLAND FARM & HARVEST** Maryland Public Television

www.mpt.org/programs/farm

Stories in Maryland Farm & Harvest are always presented through the eyes of the farmers profiled, from their perspective, for the viewer to take in, to understand and to savor. The categories of stories range across the agricultural spectrum, from conventional to organic farming and even experimental new ways of growing our food. The series has rocketed to the top as MPT's #1 rated regional show, attracting an audience of five million viewers in its first 4 seasons! Maryland Farm & Harvest lends a voice to agriculture at a critical time; and clearly a time in which the American public is ripe to receive it. The mission of Maryland Public Television is to educate its viewers - specifically this series visually takes viewers to the farm to experience what it's like to run a 21st century farm - from technological advances and conservation challenges to age-old complications, such as weather and pests. Maryland Farm & Harvest pulls back the curtain to reveal the true character of the farmer while taking their story directly to the public. The show also captures the number one reason why growers dedicate themselves to it all: their simple love of farming. These people are true heroes in the American sense—people with a deep sense of traditionalism and loyalty to the land, coupled with a unique work ethic, who regularly risk everything to grow our food. The series airs on Tuesdays at 7 p.m. on MPT-HD and re-broadcasts on Thursdays at 11:30 p.m. and Sundays at 6 a.m. Each show re-airs on MPT's secondary channel, MPT2, on Fridays at 7:30 p.m. 2017 Funding \$125,000, 2018 Grant \$150,000

#### KIDS GROWING WITH GRAINS

Washington County Extension Advisory Council | www.extension.umd.edu/ washington-county

The Washington County 4-H Youth Development Program, a part of the University of Maryland Extension (UME), presented Kids Growing with Grains, an agricultural education program that is offered as a field trip. This program is made available to all schools in Washington County, and targets primarily fourth grade students. The field trip is held at the Western Maryland Research and Education Center (WMREC) in late September. A total of 217 students from three area schools took part in the field trip during the three days of programming. This program provided over 1,085 contact hours to educate youth about grains. The program is designed to meet the needs and interests of the schools, and offer hands-on, experiential learning through a variety of lessons. Lessons included: Grains and Agriculture, Grain Nutrition, Grain Food Demonstration, Ruminant Animal Science, and Poultry Animal Science. Each lesson is presented by a collaborative team of UME Faculty and Staff, WMREC Faculty and Staff, UME volunteers, and 4-H/FFA youth. Participants learn about the health benefits of grains, the use of grain in livestock production, and develop a connection between themselves and agriculture in their community. 2017 Funding \$1,000, 2018 Grant \$1,000

#### **AG-VENTURE PROGRAM**

University of Maryland Extension, Carroll County | www.extension.umd.edu/ carroll-county

The Ag-Venture Program is designed to target fourth grade students to further their knowledge of Maryland agriculture with a focus on grain through STEM education. Nine schools in Carroll County were selected to participate in Ag-Venture in 2017. Students had an opportunity to rotate through stations consisting of Grain Production, Grain Identification, Grain Nutrition, Animal Nutrition (Dairy/Beef), and Watersheds which were taught by University of Maryland Extension faculty with support from local agricultural producers and businesses. Students cycled through each station every 35 minutes and participated in a variety of hands-on lessons. Students had the opportunity to identify grains while making grain jars, create a healthy whole grain snack, see farm equipment up close, plant seeds and sample vegetables, experience land use best management practices, experiment with milk, and interact with livestock. At the end, students and teachers provided feedback of the program. Based on pre- and posttest evaluations where conducted with all schools, a significant increase was indicated in knowledge gained. 2017 Funding \$1,500, 2018 Grant \$1,500

#### **MOBILE SCIENCE LABS**

Maryland Agricultural Education Foundation | www.maefonline.com

Grant funding supports elementary schools which have not had a Maryland Agricultural years. MAEF promoted this opportunity to schools and farm bureaus across the state to help publicize the availability of the grant. Six schools took advantage of this benefit in 2017, receiving \$500 or \$1,000 grants. These schools in Allegany and Calvert Counties are in rural communities that would otherwise not be able to afford the \$1,800 fee for a week-long lab visit. 2017 Funding \$4,000, 2018 Grant \$4,000

#### **AGSPLORATION**

University of Maryland Extension, Howard County | www.extension.umd.edu/agsploration

AGsploration: The Science of Maryland Agriculture is a statewide signature program that improves students' STEM (science, technology, engineering, and math) abilities through learning experiences that explore agricultural science. In 2017, 55 educators were introduced to the curriculum, attended trainings and received resources to implement the AGsploration program. Teacher evaluations indicated that 100% planned to utilize the curriculum within their respective classroom or outreach settings. In 2017, more than 2,800 youth

and adults participated in hands-on lessons and activities from the curriculum. Also, the AGsploration website provides youth, families, and educators with 24-hour access to lesson plans and supplementary resources. Students who participate in the AGsploration program develop a better understanding of agriculture's importance to Maryland's economy and their daily lives. They also become more interested in pursuing science and agriculture careers including careers related to grain farming. To date, the program has reached more than 32,200 youth and 899 educators, which helps accomplish extension's mission of creating an agriculturally-literate Maryland population. 2017 Funding \$3,500

#### **AGRICULTURE AWARENESS DAY**

Queen Anne's County Farm Bureau | www.mdfarmbureau.com/queen-annes

Ag Awareness Day had all the seventh graders from five schools in Queen Anne's County learn about agriculture. Students were split into groups and rotated through five different stations set up throughout the 4-H park. The stations consisted of Our Future (sub divided into Crops and Equipment & Technology), Farm Animals, Green Stuff (sub divided into Nursery/Landscape and Produce), Aquaculture, and Bees in AG. All the students were given a pre-test before attending the event and a post-test afterwards to see how much they learned from the event. They were given a booklet to fill out as they moved through the stations. The first day three schools attended, with Sudlersville Middle School arriving first. The students were given a short introduction of what was going to take place throughout the day and what they would learn through this experience. They were then split into groups and sent to two of the stations. When Centreville Middle School and Chestertown Christian Academy arrived, they were given an introduction before being split into three groups and sent to stations as the two groups from Sudlersville rotated to new stations. All the groups rotated again before lunch. The groups continued rotating through the remaining stations before returning to schools for regular dismissal. The second day of the event had the two remaining schools, Stevensville Middle School and Matapeake Middle School, attend and follow the same schedule as the first day. Students from all schools were asked for their thoughts before getting on the buses to return to school and very positive comments resulted. 2017 Funding \$5,000, 2018 Grant \$5,000

# CLOSE ENCOUNTERS WITH AGRICULTURE

University of Maryland Extension, Montgomery County | www.extension. umd.edu/montgomery-county

Close Encounters with Agriculture promotes and increases the understanding of agriculture. It demonstrates the interrelationships and positive aspects of production agriculture, nutrition and the environment. A total of 3,734 fourth-grade students, and 808 teachers and chaperones participated in the program in October 2017. Direct program costs averaged \$2.77 per student. This program is evaluated through pre- and post-tests for the students, and by teacher evaluations. Evaluations were redesigned

this year in attempt to better capture changes in student knowledge. Students scored an average of 24% correct on the pre-test. After participating in the program, students test scores rose to 87% correct on the post-test in 2017. Audience Response Electronic Clicker technology was utilized this year as part of the Nutrition Track to promote learning and evaluation. Overall teacher evaluation scores averaged 4.96 with 5.00 being the highest score. Ninety-eight percent of teachers rated the program a four or five on a scale of 1 to 5. Teachers responded overwhelmingly (93.0%) that their children had a much better understanding of agriculture after participating in this program. 2017 Funding \$5,000, 2018 Grant \$5,000

## ANSWERING CONSUMERS' FOOD AND FARMING QUESTIONS

MidAtlantic CommonGround www.findourcommonground.com

The Chesapeake region has a large urban contingent whose impressions of farming impact the policies that local farmers deal with every day. The goal of this initiative is to have consumers look to local farmers and CommonGround resources when they have questions about food and farming. Volunteer farmers are provided opportunities to share their passion for farming with consumers to relay the positive, factual story of agriculture to increase consumer trust. Consumer-focused activities are selected based on the interests of the volunteer farm women who have attended workshops where they learn about the CommonGround approach and philosophy - being inclusive of all types of agriculture and farming methods, speaking with a positive attitude, providing credible information with science-based facts, and using real stories from the farm. In the past year, volunteers have spoken to over 14,500 consumers, given presentations and worked exhibits reaching another 136,000 people, and through social media efforts, the numbers explode exponentially. These efforts are helping to shift the opinion of consumers about farming so consumers will make informed and positive choices regarding issues that impact farmers in the MidAtlantic region. 2017 Funding \$10,000, 2018 Grant \$10,000

#### FFA CHAPTER FIELD TRIP

Queen Anne's County FFA www.qacffa.theaet.com

Students visited Nagel Farm Services where they were shown how a truck of soybeans was probed to determine moisture in the bean and dockage for foreign matter, and how to test for vomitoxin in wheat. Mr. Nagel discussed grain marketing, defining terms like puts, calls and forward contracting, and explained how to read the Chicago Board of Trade prices. Students watched a truck get unloaded and saw the belts which carry grain to the tanks, then saw the corn pile illustrating the process of cooling the grain with tubes placed into the pile. At the Wye Angus Research and Education Center students saw pregnant angus cows, heard about herd genetics and culling the herd. Students learned about rotational grazing and hay on the farm. Finally, students were shown the process of herding the cattle into the chutes and the process weighing them for veterinary purposes. 2017 Funding \$400, 2018 Grant \$400

Recipients of the 2017 MGPUB Scholarship Program are: (left to right) Jenell Eck of Ingleside, Andrew Bauer of Dayton, Jamie Hetrick of Preston and Cody Morris of Parsonsburg (not pictured).

"We are proud to see these young people follow a career path in agriculture," states Jennie Schmidt, MGPUB President. "This scholarship program is a strong investment in our future to see farming successfully continue in Maryland."



LEAD Maryland Foundation, Inc. www.leadmaryland.org

The LEAD Maryland Foundation (LEAD) works to increase the numbers and capacity of leaders serving agriculture. In 2017, LEAD Fellows completed a series of five multi-day seminars throughout the state, learning through lectures, tours, discussions, trainings, and a group project. Fellows visited a diversity of farms and forests. Class X fellows learned to build and work in diverse teams. Fellows gained insight on topics such as land use, water quality, conservation, and oyster aquaculture. Fellows completed a poultry industry studyfrom hatchery to farm to product development and marketing-learning about animal agriculture, grain utilization and markets. LEAD provides public issues education, skills building, leadership development, and personal growth. Fellows become more equipped and confident to solve problems, identify resources, educate the public, and to influence public policy. 2017 Funding \$20,000, 2018 Grant \$20,000

# FARM STEWARDSHIP CERTIFICATION AND ASSESSMENT PROGRAM

Maryland Association of Soil Conservation Districts | www.mascd.net/FSCAP

This statewide program recognizes farmers for being good conservation stewards and meeting the Agricultural Conservation Stewardship Certification Standard. There have been 202 certification assessments conducted on 180 farms across the state, which resulted in certifying 153 agricultural conservation stewards managing 60,251 acres of owned and leased land. All 23 counties in Maryland are represented. To promote the program, every steward receives a 30" x 24" two-sided sign with post, acknowledging that a conservation farmer is good for business. 2017 Funding \$15,000, 2018 Grant \$10,000



#### **MARYLAND ENVIROTHON**

Maryland Association of Soil Conservation Districts www.mdenvirothon.org

The Maryland Envirothon helps students become more involved in protecting natural resources, challenging their problem-solving skills and instilling a sense of stewardship in these future leaders. Statewide, over 1,000 students participated in local county envirothons leading up to the two-day state Envirothon, held in June at Camp Pecometh in Queen Anne's County. Many of the students (and teachers) participating in the Envirothon are from urban areas and have no connection to the farming community. Students received training from resource professionals in five resource areas; aquatics, forestry, soils, wildlife, and the current environmental issue which was "Agricultural Soil and Water Conservation Stewardship". This hands-on training, followed by the hands-on competition, is what makes the Envirothon a unique environmental education program. MGPUB-sponsored scholarship checks were presented to each student on the top three placing teams. 2017 Funding \$5,000, 2018 Grant \$5,000

#### **CULTIVATING LEADERS**

MD FFA Foundation www.mdffafoundation.org

Maryland FFA is a premier agricultural career and leadership development program for young adults. In 2017, the Association had 2,424 members, representing 48 Chapters. Nearly 500 Maryland members and guests attended the state FFA convention. At the 2017 National convention in Indianapolis, Indiana, Maryland competed in 26 Career Development Events. Ten teams received Silver awards and eleven teams received Bronze. Individual members received 28 Gold Awards, 33 Silver Awards, and seven Bronze Awards, with one individual placing second in the nation. Seven State Proficiency Award winners competed at the national competition. During the national convention, 15 Maryland FFA members were awarded the American Agriculturalist Degree, the highest degree awarded to an active member. The board of the FFA Foundation believes the development of agricultural leaders is vital to the future of Maryland agriculture. 2017 Funding \$13,000, 2018 Grant \$13,000

#### **NEW 2018 GRANTS**

Yield Grains, Target Pests Managed, and Secondary Pests Associated with Pyrethroid Insecticide Use

Kelly Hamby | University of Maryland | \$15,000

Evaluating the Application Window for Wheat using Syngenta as a New Fusarium Head Blight Fungicide "Miravis" Nidhi Rawat, University of Maryland | \$10,000

Evaluation of Nitrogen Modeling Tools to Optimize In-season Nitrogen Recommendations for Corn

Gurpal Toor | University of Maryland | \$20,000

A Regional Survey of Soil and Tissue Tests to Observe Critical Nutrient Levels Jarrod Miller | University of Delaware | \$2,842

#### **MARYLAND GRAIN PRODUCERS ASSOCIATION**

Maryland Grain Producers Association | www.marylandgrain.org

Serving as the voice of grain farmers, the Maryland Grain Producers Association (MGPA) works to protect and promote the grain industry in Maryland. MGPA conducts consumer education initiatives, such as the www.MyMDFarmer.com campaign reaching 1.5 million viewers monthly. This initiative puts a face on Maryland farmers and shares what is going on locally to improve the understanding of neighbors and urban communities. Utilizing digital platforms, information is shared through Facebook and Twitter. A bi-weekly e-newsletter provides timely grain information to farmers. Promoting ethanol through the DriveFlexFuels.com campaign saw significant increases in regional ethanol sales, ultimately increasing demand for corn. MGPA administers and promotes the college scholarship program, which provided four students pursuing agriculture careers funding in 2017. This investment in Maryland's future has seen recipients take leadership roles in their communities as well as state and national farm organizations. The Maryland Commodity Classic, the premier annual meeting of Mid-Atlantic growers, was planned and conducted to connect growers with the latest information and resources available through projects of the Maryland Grain Checkoff Program. Board members and staff represent grain growers at events and meetings regarding policy and regulations, to ensure that the interests and impact of grain farmers are known. MGPA coordinates with affiliated national organizations to ensure local grain farmers are provided with the most current resources and market access to expand utilization and sale of grain. 2017 Funding \$100,000, 2018 Grant \$75,000

#### Join us—we work for you!

If you are a grain producer, your dues are even free!
Your checkoff assessment will pay your MGPA membership.
Members also receive a complimentary Maryland Commodity Classic ticket.
For Membership Form, visit: marylandgrain.com/member\_benefits.htm

#### **Questions?**

<< Contact the office or your regional rep listed to the right >>

# 0.1% Oats 0.2% 0.8% 4.2% Grants 17.8% Grants

Corn	\$ 788,946
Wheat	\$ 182,823
Barley	\$ 8,468
Oats	\$ 1,255
Grants	\$ 43,000
Interest	\$ 2,293

#### **MGPUB EXPENSES**



Market Development	\$ 424.637
Education	\$ 266,688
Research	\$ 109,792
Program	\$ 93,589
Refunds	\$ 34,162
Administration	\$ 32,929
MGPA Membership	\$ 9,125

ALTA CPA Group, LLC, audited the Maryland Grain Producers Utilization Board and determined the accounts to be in order. A copy of the report is available by calling 443-262-8491.

Regional directors serve on both Utilization and Association Board of Directors.

Meetings are held quarterly with a funding meeting in January.

#### **REGIONAL REPRESENTATIVES**

Region 1: Somerset, Wicomico, Worcester
John Bruning 443-783-4833
Bobby Guy 410-546-9191

Region 2: Caroline, Dorchester, Talbot Jim Saathoff 410-634-2678 Hank Spies 410-924-2308

Region 3: Cecil, Kent, Oueen Anne's Lewis McDonald 410-991-7817 Evan Miles, Jr. 410-708-0032

Region 4: Baltimore, Carroll, Harford, Howard Melvin Baile, Jr. 410-848-3174 Mike Harrison 410-382-1196

Region 5: Anne Arundel, Calvert, Charles, Prince George's, St. Mary's Syd Moreland 301-769-2480 Donnie Tennyson 301-872-5612

Region 6: Allegany, Frederick, Garrett, Montgomery, Washington Eric Spates 301-428-8033 James Weddle 301-573-8305

# MARYLAND GRAIN PRODUCERS UTILIZATION BOARD

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& NBGA Director

Vice President Bobby Guy

Treasurer Allen Davis

Secretary James Weddle

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NCGA Director Chip Bowling

USGC Director Chip Councell

USW Director Jason Scott

#### Advisorv

MD Dept. of Ag Mark Powell
University of MD Robert Kratochvil

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## MARYLAND GRAIN PRODUCERS ASSOCIATION

President Lenny "Evan" Miles

Vice President Melvin Baile

Treasurer Donnie Tennyson

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#### Advisory

MD Dept. of Ag Steve Connelly University of MD Ronald Mulford

#### **OFFICE**

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Afternoon session provides updates on hot topics domestic and international with U.S. Secretary of Agriculture, Sonny Perdue (invited)





Research Talks begin at 9:30 am

**Checkoff Project** & Commercial **Exhibits** 10:30 am

Afternoon **Program** & Awards 1:00 pm

Chicken & Pork BBQ and Crab **Feast** 

- ✓ Tickets are \$10 prior to 2:30 pm, \$20 after 2:30 pm, no entry after 3:30 pm.
- ✓ Grain farmers can receive complimentary tickets if a member of MGPA—see page 11

Thank you to our sponsors who help bring the latest ag news and research to grain farmers at the Commodity Classic!

Ag Risk Management Agriculture Law Ed. Initiative **BIO-CAT Microbials** Dekalb/Asgrow Delmarva Farmer Delmarva Poultry Industry DE-MD 4R Alliance Eddie Mercer Agri-Services, Farmsite Technologies Fulton Bank **Growmark FS** Hoober, Inc. Hostetter Grain, Inc.

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