

## EPA Tours Maryland Crops & Weeds Research

In its continuing quest to keep regulators connected with current farming practices, the Weed Science Society of America (WSSA) the University of Maryland and the University of Delaware led a group of EPA scientists through row crop and specialty crop research plots on September 13. The EPA staffers work on issues and topics across the United States and were eager to learn more about the agriculture in their backyards.

The field tour took place on the Wye Research and Education Center, which encompasses 1,000 acres along the Wye River on the Eastern Shore of Maryland. Perched along the Chesapeake Bay, the center is well situated to evaluate conservation agriculture techniques, such as no-till, cover crops and field buffers, explained the Center's director, Dr. Kathryn Everts.



Farmers in the mid-Atlantic states face some of the most restrictive regulations aimed at reducing nutrient run-off and pollution of the Bay, University of Maryland Extension Agronomist Dr. Nicole Fiorellino reminded the tour. As a result, Maryland ranks number one in the country in the percent of agricultural fields in cover crops, and number two for fields devoted to no-till. "The mid-Atlantic region in general has led the way in the nation in conservation practices," she explained.

This dynamic makes the University of Maryland's agriculture research particularly essential, as lawmakers turn to the ag scientists there to help set those regulations. "For instance, UMD

nutrient management recommendations have become their regulatory guidelines,” as Dr. Fiorellino put it.

## TILLAGE, COVER CROPS & WEEDS

John Draper, a Centreville, Maryland farmer who works as the center’s farm manager, parked a series of tillage implements for the EPA employees to examine – a chisel plow, a cultipacker, and a field cultivator and roller. The equipment set the stage for a discussion of a nearby series of demonstration plots, examining the differences in corn stands grown on tilled plots, no-till plots and plots with cover crops.



*Top: Dr. Nicole Fiorellino discusses differences in production systems between tilled, no-till, and no-till with cover crops. Bottom: A display of tillage equipment.*



Some of the agronomic differences observed between the plots were weed control, nitrogen uptake, stand uniformity and yield, Draper said. Draper and Dr. Fiorellino also discussed the differences in planting equipment and fuel consumption required for tilled versus no-till plots, complete with a planter demonstration.



*Left: John Draper answers questions about the workings of a no-till planter. Right: Field day participants examine seed trench and seed placement.*

There to help explain the effects of these different production practices on weed management – particularly the herbicide-resistant weeds plaguing the mid-Atlantic – were University of Delaware Extension Weed Scientist (and WSSA liaison and tour organizer) Dr. Mark VanGessel, as well as University of Maryland Extension Weed Scientist Dr. Kurt Vollmer.

Top of the list of problematic weeds in the region are Palmer amaranth, marestail (horseweed), lambsquarter, morningglory and johnsongrass. The group discussed the different herbicide-tolerant crop varieties available to try to control these weeds, as well as the mounting herbicide-resistance problems that continue to endanger herbicide use in both the region and across the country.



*Left: Dr. Kurt Vollmer discusses the need for effective herbicides to control weeds prior to no-till planting. Right: Dr. Mark VanGessel demonstrates soybean growth stages.*

Dr. Vollmer discussed recent research on how different nozzle tips affect the spray penetration of in-row (between individual crop plants) and inter-row weeds (between crop rows).

GROW postdoctoral researcher Dr. Eugene Law explained the role cereal rye cover crop mulch can play to help farmers implement different integrated weed management tactics. Cover crops help, by smothering weed seeds early in the season and reducing and slowing their emergence. This can keep the weeds to a manageable size as farmers wait to get into the field to spray herbicides during the oft-soggy mid-Atlantic springs, Law said.

“Combining chemical and cultural management like this can help give you more flexibility with those narrow spray windows,” he explained.

Draper also called attention to an equally wily pest of Maryland row crops – the booming local deer population. Bambi, it turns out, has a robust appetite for just about every row crop except sorghum and hemp. Draper estimated that many row crop operations lose \$15,000 to \$20,000 a year to deer feeding, particularly on the edges of fields. Solutions are costly and include repellent sprays, fencing and trap crops – and as a last resort, hunting.

## DIGGING INTO SPECIALTY CROPS

Chris Cochran, Talbot County vegetable farmer and Wye’s Fruit and Vegetable Farm Manager, walked the group through fruit production practices in the region. Highlighting grapes, blueberries, and blackberries, Cochran described the challenges of pesticide use on farms growing a variety of specialty crops. These crops have many of the same issues with herbicide resistance as field crops, and often without the diversity of tools available. Perennial crops do

not allow for cultivation, there is a limited number of herbicides registered for these crops, and damage from herbicides can have ramifications for future years. For instance, perennial weeds such as poison ivy or green brier are not tolerated in u-pick berry production and require chemical control, but use of glyphosate and accidental contact can kill the berry bushes.

Another complicating factor is the use of drip irrigation within the row of bushes, which keeps the soil moist and favors microbial activity that degrades herbicides faster than in non-irrigated field crops. This often leads to weeds emerging sooner in these treated rows and requiring additional management.

Cochran and his team also demonstrated specialized pesticide application equipment for specialty crops. They showcased a hooded sprayer, which allows for herbicides to be applied to the interrow areas of vegetables grown with black plastic, allowing for better crop safety and less herbicide use across the field. They also discussed the airblast sprayer and its utility for tree fruit.

## FIELD TOUR IMPACTS

Approximately 30 EPA staffers participated in the field day, representing at least five divisions within the Office of Pesticide Programs.

Of those, 91% said the tour increased their understanding of agricultural production systems and the intersection of agricultural production practices and weed management. Also, they estimated that they are “likely-to-extremely-likely” to use this information in their current roles.

All respondents said they were also likely to attend a future field day and would encourage a colleague to participate.

When asked for suggestions on improving this field day and future ones, one respondent noted: “Honestly, I think this was the best one-day tour I've ever been on in terms of feeling like I can apply the information I learned in my work. This was really conversational and clear that the staff who planned the tour had been thinking about us and what we might be able to apply, especially based on things going on with ESA right now. Overall, no notes, extremely well done!”

“I thought the day was perfect - we learned a lot, I have an even higher appreciation for the enormous challenges farmers face, especially in the Mid-Atlantic,” wrote another respondent. “.. [A]nd the opportunity to talk to everyone and ask questions about what they do, the research into weed science and asking what things they would improve (labels!!) was excellent. I wouldn't change a thing.”

“This is one of the best local/day tours I've been on,” concluded another EPA employee. “I learned a lot. I enjoyed that it was all at one location (cut down on the driving) and that there was a wide variety of crops and application methods/equipment available for discussion. I

appreciate how thoughtful the University was with setting up the different demonstration plots. Thank you all!”

“No, but thank you so much for putting this together for us,” concluded a final comment about the need for changes to the tour. “It was fun and informative. I know it must have been a lot of work to do, so I want you to know it is very appreciated.”

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