

St. Georges Tech students ask: 'How safe is our produce?'



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(Photo: JENNIFER CORBETT/THE NEWSJOURNAL)

Eat your fruits and vegetables.

Moms say it, the federal government recommends (<http://www.cnpp.usda.gov/DietaryGuidelines>) it and the health conscience espouse it – all for good reason.

A diet rich in produce can lower blood pressure, reduce the risk of heart attack and even ward off some cancers.

But failing to properly wash those vitamin- and nutrient-rich foods also can deliver small doses of residual pesticides and herbicides.

And over time, advocacy groups say, those chemicals can lead to an increased risk of cancer, kidney disease, birth defects and learning disabilities.

Data from the U.S. Department of Agriculture (http://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Chemical_Use/) shows the use of pesticides and herbicides is on the rise – a trend some link to pests resistant to the genetically modified crops (<http://naturalsociety.com/gmo-lies-study-shows-how-pesticide-use-soars-with-more-gmo-crops/>) that were supposed to reduce the need for such chemicals.

A team of junior researchers at St. Georges Technical High School is now working to determine how often those toxins show up in Delaware and which types of produce are the biggest culprits.

“I personally eat a lot of fruit and vegetables, so I definitely want to find out which ones have pesticide on them,” said 17-year-old senior Sadie Sanclemente.

“I’d like to have negative results every single time,” she said. “But at the same time, I think it would be cool to get at least one positive.”

Last month, Sanclemente and about a dozen classmates in St. Georges’ biotechnology program (<http://www.stgeorgesde.com/career-programs/biotechnology/>) began their inquiry as part of a 6-month independent research project called Students Teaching Essential Pesticide Safety (STEPS).

The goal, according to teachers Danya Espadas and Russ Mauger, is to provide students with a hands-on lesson in laboratory procedures, while raising awareness about an important public health concern.

The project will require students to conduct rigorous scientific research.



A lime sits in test solution made by ANP Technologies, a Newark based biotech company that creates test for pesticides and toxic metal. The company has partnered with St. Georges High School's Biotechnology classes to teach students how to test for the poisons in fruits in vegetables. (Photo: JENNIFER CORBETT/THE NEWSJOURNAL)

“But the end result,” Espadas said, “will be something with real meaning that affects their community every single day and that’s what really inspires them.”

Now in its second year, the STEPS project is a collaboration between St. Georges Tech and Ray Yin, founder of the Newark biotech company ANP Technologies.

Spun out of the U.S. Army Research Laboratory at Maryland's Aberdeen Proving Ground in 2002, ANP Tech develops early-warning detection systems designed to protect military personnel from chemical and biological attacks.

The company recently modified one of its devices into a [home test kit \(http://www.anptinc.com/index.php?option=com_content&view=article&id=140\)](http://www.anptinc.com/index.php?option=com_content&view=article&id=140) that can detect the presence of commonly used pesticides and herbicides on fruits and vegetables. The company sells a similar kit for testing wine.

"The technology originally was developed to find chemical weapons," Yin said. "But the fact is pesticides belong to the same class of nerve agents. They're just much weaker because they're designed to kill small bugs and not humans."

A chance meeting between Yin and Roger Seedorf, St. Georges' cooperative employment coordinator, began a discussion about how the test kits could be used expand what biotech students are learning in the classroom.

"At Delaware vo-tech schools, we try to find opportunities for seniors to work in their chosen fields," Seedorf said. "But biotech can be a little tricky because most labs will only take kids who are at least 18 years old."

Yin and the biotech teachers at St. Georges worked together to come up with the first STEPS research project piloted at the school last year.

As a final test, the students presented their findings to Yin, who pushed and prodded them about their research, much like they might experience from a boss in the real world.

"What that group found was most of the problem comes from [apples, grapes and strawberries \(http://www.rodalorganiclif.com/food/most-pesticide-laden-produce-youre-eating\)](http://www.rodalorganiclif.com/food/most-pesticide-laden-produce-youre-eating), especially those from Chile and Mexico" Mauger said. "If you ever get an apple with a little dirt near the stem, that's not dirt. It's dried pesticide."

St. Georges will repeat the project again this year with nearly a thousand test kits purchased from ANP Tech for about \$900 – a significant discount from the standard retail price.

Biotech students participating in this year's project will collect 10 fruits or vegetables a week from grocery stores, farmers markets and even the school cafeteria.

Each piece of produce is then soaked in separate container of water for about 10 minutes. Using a small plastic eye dropper, the students drop samples from the bath into two wells on each test strip.

The students will know a pesticide is present if the panes next to each well fail to turn blue.



ANP Technologies, a Newark based biotech company that creates test for pesticides and toxic metals, has partnered with St. Georges High School's Biotechnology classes to teach students how to test for the poisons in fruits in vegetables. (Photo: JENNIFER CORBETT/THE NEWSJOURNAL)

Once a month, the students will meet, compile their data and post their findings on [ANP Tech's website \(http://www.psmn.org/node/7\)](http://www.psmn.org/node/7) where the public can search the results by zip code.

The St. Georges students will record where their produce originates and is purchased, but only the percentage of positive hits will be publicly accessible.

"We're not putting the names of the stores out there," Espadas said. "These are kids and we're not looking for any lawsuits."

For now, even that partial data will be limited to southern New Castle County, but Yin hopes to expand the program to other schools and eventually create a network of researchers across the state.

"It's such an important thing the school is doing, by not only educating the students, but also publishing the information for free so the general public can get a benefit out of it," Yin said. "I mean, wouldn't you want to know whether what you are eating is clean or not?"

Some parents certainly do.

“My mom is a vegetarian so all she gets at the grocery store is fruit and vegetables,” said 17-year-old Micaiah Dendy of Middletown. “On the first day of the project, she had me testing everything.”

In addition to raising awareness, the STEPS project also has had some early success in changing behavior – even if it’s only among the teachers overseeing the research.

“Now when we buy grapes my wife make me put them in a basin of water and really scrub them,” Mauger said. “I don’t think any of us will eat fruit the same way again.”

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Steps to preparing fruits and vegetables

- Wash your hands with hot soapy water for at least 20 seconds before and after handling fresh fruits and vegetables. Dry with disposable towel.
- Clean the sink and cutting boards with hot soapy water before and after washing and preparing fresh produce.
- Wash ALL fresh fruits and vegetables, including organically grown, farmers market and homegrown produce.
- Wash produce just before cooking or eating.
- Wash under cold running water.
- When possible, scrub fruits and vegetables with a clean brush or hands under running water. To sanitize brush, clean in dishwasher, place in boiling water for 20 seconds, or rinse in a sanitizing bleach solution.
- Drain or dry produce with disposable paper towels.
- If you choose to soak your fresh produce to remove excessive soil, be sure to rinse it under running water afterwards and dry with disposable paper towel.
- Remove hulls or cut greens after washing, not before.
- Do not use dish detergent or antibacterial soaps to wash fresh fruits and vegetables because soap and detergent residues can remain on the product.

Source: University of Delaware Cooperative Extension

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