University of Kentucky researchers one step closer to corn earworm control

BY KATIE PRATT, University of Kentucky College of Agriculture, Food & Environment

Findings from a University of Kentucky student's undergraduate research experience could help farmers control one of their most troublesome pests.

Alonna Wright, a junior from Morgantown, Ky., works with a genetically selected, mutant form of a nudivirus. This nudivirus causes a sexually transmitted disease only found in the corn earworm. In one-third of the cases in nature, virus infection results in insect sterility. The genetically selected form causes an insect STD resulting in 100 percent sterility, and as Wright has found, could give a boost to the naturally occurring virus to make it more effective.

"It's a very labor intensive process, so when we finally got this mutant after months and months of screening, we were just so excited," said Wright, an agricultural biotechnology student in the UK College of Agriculture, Food and Environment. "We knew this project was viable. We knew this could have an impact on millions of people and many crops. It was elating. I couldn't be happier."

The corn earworm causes an estimated $2 billion in damage and cost of control each year. Two closely related insects in South America and Asia are even more destructive.

While Bt corn controls many insect pests, the corn earworm is resistant. In fact, with less competition from other insects, the worm can cause more damage to corn. Farmers may not know it's there until the ears are exposed. The corn earworm is known to have 123 plant hosts so far, including many cultivated plants, and it is active not only in corn but in tomatoes, cotton and sorghum.

The mutant virus was developed by Kendra Steele, a research scientist and Wright's mentor at ParaTechs in Lexington.

ParaTechs is a privately held biotech company co-founded by UK entomologist Bruce Webb.

"We think this is a way that we can bring in a safer and more effective way to control these pests. That would help us reduce the use of pesticides on the environment," Webb said.

For Wright, research has been her passion since a genetics class she took while attending high school at The Gatton Academy of Mathematics and Science in Kentucky. A paper she wrote about her nudivirus project won the North American Region of the Alltech Young Scientist Program. Wright will compete in May against the three other regional winners for the grand prize, $5,000 and a fully funded doctorate.

An undergraduate research experience either at UK or with a private business is a degree requirement for all agricultural biotechnology students. Steele and Webb, who have mentored several of the program's students throughout the years, agree Wright's talent is not something they see every day.

"Alonna is learning, growing and getting better every day," Steele said. "If she wants to become a scientist, I fully support that. She's very good. She's a natural."

"In the agricultural biotechnology program, we plug students into a scientific area and give them the opportunity to excel," Webb said. "Alonna is a pretty special student though. She came to the program with exceptional qualifications having already had research experience and interest in genetics."

UK and ParaTechs have applied for a patent on the technology. ParaTechs plans to begin a three-year environmental evaluation to show the virus can reduce corn earworm populations in the field.