SWEET SUCCESS FOR SORGHUM GROWERS
WE ARE OKLAHOMA. WE ARE CROPS.

A comprehensive response to sugarcane aphids infestations from OSU Cooperative Extension and research programs helped Oklahoma grain sorghum producers save more than $7 million in lost grain yields annually since 2013.

It was 2013 and an agricultural war of survival had swept into southern Oklahoma, eventually expanding to the Panhandle by 2015: Sugarcane aphids, small sap-sucking insects that are among the most destructive to plant life on the planet, had discovered sorghum is an equally yummy crop to infest and were on the move.

Oklahoma farmers and ranchers plant between 300,000 and 400,000 acres of sorghum annually. The state ranks fifth nationally in the production of sorghum for grain and eighth nationally in the production of sorghum silage for livestock feed, according to USDA National Agricultural Statistics Service data.

“We don’t grow sugarcane and so were definitely not prepared for the infestation,” said Mason Bolay of Bolay Farms in Noble County. “We did some research but found very little definitive information related to sorghum, mostly just horror stories from neighbors about the crop-jumping pest. Different people were telling us different ways we had to spray to control the aphids. There was definitely a learning curve.”

A 2007 graduate of the Oklahoma State University College of Agricultural Sciences and Natural Resources, Bolay knew who to contact for help: The Oklahoma Cooperative Extension Service. OSU Cooperative Extension educators and specialists came out and examined the Bolay operation’s sorghum fields.

“Our family farm began in 1893, right after the historic Oklahoma Land Run that year,” Bolay said. “We’ve worked with the OSU Division of Agricultural Sciences and Natural Resources as a cooperating partner many times over the years, hosting on-site research demonstration plots. We knew from experience that could generate the best solution to the issue, so when OSU asked that is what we did with part of our sorghum fields.”

Extension specialists and scientists with DASNR’s statewide Oklahoma Agricultural Experiment Station system teamed up with Bolay Farms to identify the infestation level and develop educational programs detailing research-based management practices to those in need of factual information that was in short supply.

“Looking at Texas, Louisiana and Mississippi back in 2013, it was clear Oklahoma needed to prepare for what was coming our way,” said Tom Royer, OSU Cooperative Extension Integrated Pest Management coordinator. “By 2015, we had found the sugarcane aphid in 27 counties, infesting a minimum of 200,000 acres, more than half of all sorghum acres statewide.”

Sugarcane aphids can be extremely dangerous to sorghum grown for grain and forage, capable of increasing into large numbers quickly, often numbering thousands of aphids per untreated field. How fast? According to USDA-NASS data, the 2013 sugarcane aphid infestation zone extended across nearly 2 million acres of grain production in four states. The zone expanded rapidly to nearly 3.2 million acres across 12 states in 2014.

“They damage plants directly through their feeding, often killing leaves outright if the infestation is significant enough,” said Ali Zarrabi, OSU Sugarcane Aphid Team researcher with the department of entomology and plant pathology. “They also
damage plants indirectly by coating leaves and seed panicles with honeydew, creating a breeding ground for diseases like sooty mold and ultimately interfering with harvesting operations, adding to operational costs that most producers can ill afford.”

As a rule, Oklahoma crop producers and the agricultural professionals who serve them expect challenges and are quick to react. At the first hint of a growing problem in 2013, the Oklahoma Sorghum Growers Association contacted DASNR.

“They initially requested our support for an emergency Section 18 registration from the Environmental Protection Agency to allow producers to use sulfoxaflor as a control agent,” Royer said.

Sulfoxaflor is an insecticide that acts as an insect neurotoxin, acting on the pest’s central nervous system and eventually resulting in muscle tremors followed by paralysis and death.

“In addition to our Section 18 registration support, the Sorghum Checkoff Program funded five research and Extension demonstrations to evaluate pest control options and the impact of the aphid on sorghum production,” Zarrabi said.

It was during the 2014 growing season that discussions arose regarding the effectiveness of insecticides for control — most registered insecticides were found to provide poor control — and, equally important, when to treat a field because of the aphids ability to rapidly increase in numbers.

“Demonstration plots coordinated by our Sugarcane Aphid Team indicated the Section 18 emergency registration saved Oklahoma sorghum growers somewhere between $7.2 million and $14.4 million in total lost grain yield, depending on whether an individual producer sprayed his or her crop once or twice,” Royer said.

According to USDA-NASS data, the five-year average in cash receipts for Oklahoma grain sorghum production is slightly more than $48 million annually. Grain yield, which is a measure of how much crop is produced and harvested per acre of land, is a large driver for agricultural profitability.

“We’re talking about farmers’ wallets and the state economy taking a significant hit,” Royer said. “Most farmers’ profit-loss margins are tight, so it can literally be a question of operational survival.”

In time, data collected from replicated demonstrations indicated uncontrolled or poorly controlled infestations can reduce sorghum yield by 18 to 30 bushels per acre. In extreme cases, uncontrolled infestations can lead to a complete loss of grain yield.

Statewide sharing of results from the demonstrations to Oklahoma growers has resulted in the selection of more resistant hybrids and timely insecticide applications, which has reduced yield losses from sugarcane aphid infestations significantly.

“We had faith OSU would get a handle on it and let everyone know what to do,” Bolay said. “The aphid presence on our operation has been minimal for several years now.”

It is a similar tale across much of the state today. In 2017, the sugarcane aphid’s presence in Oklahoma was largely limited to a few areas just north of the Red River.

A member of the Sugarcane Aphid Team, OSU graduate student Jessica Lindenmayer has experienced firsthand how research leads to the development of practical Extension programming that helps Oklahomans solve local issues and concerns.

“People hear about the land-grant mission, but to be a part of the team for several years now and experience the day in, day out commitment needed to make a positive difference in producer’s lives is career training more valuable and insightful than almost anything,” she said.

The OSU Sugarcane Aphid Team consists of DASNR scientists Royer, Zarrabi, Lindenmayer, Josh Lofton, Kris Giles and Kelly Seuhs, as well as USDA researcher N.C. Elliott. Numerous Extension and Experiment Station staff members also have aided the effort.

Additional information about the OSU Sugarcane Aphid Team and other OSU Integrated Pest Management programs is available online at entoplp.okstate.edu.

- By Don Stotts

WeAreOklahoma.okstate.edu

Oklahoma State University’s Division of Agricultural Sciences & Natural Resources is dedicated to developing and disseminating science-based information relevant to helping people improve the quality of life for them, their families and communities. The Division is comprised of the College of Agricultural Sciences & Natural Resources, the Oklahoma Agricultural Experiment Station and the Oklahoma Cooperative Extension Service.