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## Know your roots: Wings of Knowledge program educates students and farmers

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Gonzales >> It's Friday morning at Pisoni Farms and a group of students from Gonzales High School are working on a project that will hopefully one day change the world. But for now, sophomore Elizabeth Arreola and junior Pablo Mendoza are working to help improve their local farms in the Salinas Valley.

Arreola and Mendoza are digging holes in a broccoli field patch to gather soil to get tested at Hartnell College for nutrients. But, the hole will also serve a purpose to put in one of the student-made wireless soil sensor probes to test for water levels.

All of this is part of the Wings of Knowledge program, which started in 2015. The program has equipped Gonzales High and Middle school students with a focus on the curriculum application of STEAM: Science, Technology, Engineering, Arts and Mathematics.

"I actually really liked (the program) because we're working with the community. We have teachers, we have students. I really like this collaboration that we had, that was the big seller for me," Mendoza said.

There are 36 high school students and nearly 40 middle school students currently working with ranches and growers primarily in Monterey County. Right now, the mission is to design and manufacture soil sensor probes that capture vital field data, carry out software-based analysis and provide insights to growers to improve water usage.

As of August 2017, the project included Pisoni Farms in Gonzales, Borzini Farms in Greenfield, Christensen and Giannini in Chular, Costa Farms in Gonzales, Gizdich Ranch in Watsonville, Lakeside Organics in Watsonville, Rava Ranches in San Lucas, Woolf Farming in Huron, Salinas Land Co. in Greenfield, Treleven Grapes in Gonzales and Premier Raspberries in Watsonville.

"And the cool part about the farms is that each different farm you go to is a different experience for everyone because not every farm is the same," Arreola said.

Arreola, who joined the program two years ago, said it's unbelievable to be part of a program that can be beneficial for the future of the ag industry.

"I never imagined myself being here and actually being part of something that can one day be really, really big," Arreola said. "If we keep doing this, maybe more farms will want us to build probes for them and travel to other places to put them in and install them."

Vahid Motazedian, the co-founder and executive director of Wings of Knowledge, said the program is aimed to help cultivate local science and engineering talent within the students, while helping growers operate more efficiently.

“(The program) evolved really naturally,” Motazedian said. “Finally it came down to ‘Why don’t we develop soil sensors’ and we can actually do that technology and we did that.”

But Motazedian, 43, said once that was done then other questions from farmers popped up like “How much water does celery need?”

“And then we realized we don’t know much about plants and we don’t know much about soil. Suddenly that became a new area for study, he said.

That’s when Motazedian recruited more students who were interested in studying soil, plants along with water and weather conditions.

“As we do stuff and as the kids go out, new questions are asked,” he said. “As we answer one question like ‘How do we measure moisture level of soil?’ We answer that question but then that’ll open up three or four new questions.”

Motazedian, who previously worked at several firms in the Silicon Valley, runs the technology area that deals with system, software and hardware development. The students can also join the agriculture group where they go out to work on the farms and sustainability group, which deals with water studies and climatology in collaboration with NOAA

Last year, 38 high school students helped lead the program that included teaching about 180 younger students at La Gloria Elementary School.

Pisoni Farms ranch manager Jesus Camacho said he was a bit surprised that a group of high school kids would try to tackle such a big project.

“People always learn new things from people they least expect. It doesn’t matter if they’re young or older, it doesn’t matter,” Camacho said. “A person might not say anything, but that’s because they’re paying close attention to what’s going on. At the end of the day, you take in whatever you think was useful.”

Camacho said he’s passionate about the agriculture industry and everything he does comes from the heart. So, he also likes the fact that kids are getting involved with projects that take place out in the field and not behind a desk.

“A young person who’s interested in doing something different like a project that can help other people or serve as something for the future is good,” Camacho said.

Jazmin Lopez, who is the Pisoni Farms compliance manager, said she’s excited to have students as being the ones to collaborate with and actually help improve water regulation on the ranch.

“They’re learning from us and they’ve learned a lot from Jessie (Camacho) because he knows what the plants need,” Lopez said. “In return, we’ve learned a lot from them about this new technology and how to apply it on the ranch, as well as how to improve water usage.”

As the group of Gonzales High students wrapped things up for the day, Mendoza said he really enjoys the

experience and it's one of the positives of being in the program.

“You’re seeing the work professionals do and most importantly there’s the possibility that you can also help them out. You’re being part of this bigger project for them,” he said.

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