

People & Places

Machine learning aids irrigation

By PADMA NAGAPPAN
For the Capital Press

As a cooperative extension specialist with the University of California-Davis, Sahap Kaan Kurtural leverages artificial intelligence to enable vineyard managers to optimize irrigation without huge capital investments.

During his doctoral coursework at Southern Illinois University, the native of Turkey picked up skills in statistical analysis and machine learning algorithms. He now uses those skills to help wine grape growers achieve efficiencies in irrigation by setting up micro soil management zones.

“Different sections of plants ripen at different times, so the first challenge was to understand the systems and why certain parts of a vineyard were on a different schedule than others,” Kurtural said. “It could be due to topography, but also due to texture and make up of the soil.”

He has studied this in broad swaths of California’s wine grape region, including Napa Valley, Lodi, Sonoma and Paso Robles.

“We used machine learning algorithms to understand why these areas were behaving differently despite being given the same amount of water and fertilizers,” Kurtural said. “So there was



UC-Davis

Sahap Kaan Kurtural, a cooperative extension specialist in viticulture with the University of California-Davis, uses sensors and artificial intelligence to manage irrigation.

physiological imbalance, and some portions were going into stress earlier than others.”

Manufacturers have sprinklers on the market that promise to adapt to variable conditions, but not many deliver that since it requires a lot of investment in sensors.

Farmers need to take the time to adapt the sensors to different crops and soil conditions.

“We have some 400 crops in California, which ones are you going to test them for? You have to be realistic at some point,” Kurtural said.

His machine learning

algorithms can bridge the gap between the promises and reality.

His work is quite straightforward. He uses mobile sensors that can be mounted on tractors or ATVs. The sensors “float” on top of the soil and send signals into it to produce data on the conditions below the surface of the ground. That raw data is converted into soil moisture data and modeled for the entire season. It helps map the field into sections categorized by stress levels.

“We typically have two to three management zones with varying soil metabolism and moisture condi-

tions,” he said.

He has developed digital soil maps for several well-known wineries. The maps enable them to program mechanical harvesters for segregated lots within a vineyard without spending huge sums of money. At the same time, they save money on energy.

The fundamental work is done at the cooperative extension Oakville station in Napa County.

“For those who don’t have the technology to use our maps, we’ve developed a kit to identify biomarkers that will tip owners off,” Kurtural said.



Western Innovator

SAHAP KAAN KURTURAL

Title: Cooperative extension specialist in viticulture at the University of California-Davis

From: Izmir, Turkey, has lived in the U.S. since 1994, when he came to attend college but also came previously as an exchange student in 1990

Education: B.S. and M.S. in plant sciences and Ph.D. in plant physiology, Southern Illinois University.

Family: Raises raisin grapes in Turkey; married with two young boys. Wife, Carrie, is an attorney for the state of California

Research focus: Irrigation for viticulture using artificial intelligence

Website: <https://www.facebook.com/OakvilleStation/>

Montana ranchers learn to live with grizzly bears

By AARON BOLTON
Montana Public Radio

KALISPELL, Mont. (AP) — Grizzly bears are repopulating areas of Montana that haven’t seen them for decades, creating more conflict between livestock, people and bears. Some ranchers are learning they need to do something that doesn’t come naturally — change how they live on the land.

As bears were hibernating in their dens this winter, the Blackfoot Stockgrowers Association held a meeting in Choteau to provide a space for ranchers like Mark Hitchcock to talk about working alongside the growing number of grizzly bears on the Rocky Mountain Front.

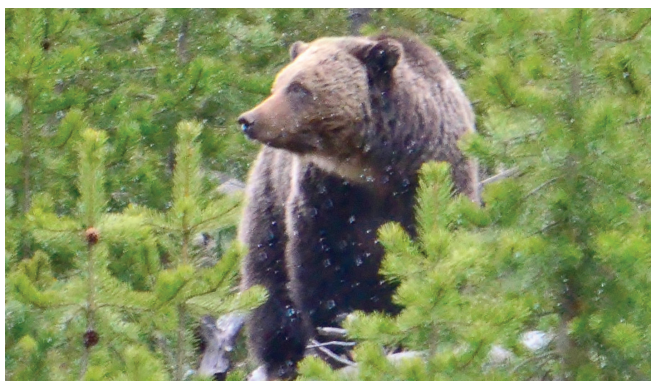
“If the animals aren’t there, my cattle aren’t getting killed. If we can deal with the problem, we don’t have to be refunded,” Hitchcock said.

The number of sheep, cattle and other livestock killed by grizzlies in Montana is going up. And even though the state pays for some of those losses, ranchers say they face unseen costs such as stressed cattle with lower pregnancy rates and end-of-season weights. Because of that, ranchers like Hitchcock can get fixated on how to reduce the number of bears.

His daughter hopes to slightly change that view.

Driving on her ranch near Valier in early February, Trina Bradley says she’s seen bears on the front since she was a kid, but there are more of them now.

“But most of the time, we just see where they’ve been. Those are the bears we like to have out here. The other ones are just in my yard, in my



File Photo

Montana ranchers are trying to live with the influx of grizzly bears.

face,” Bradley says.

Bradley steps out to open a gate to her calving pasture, where the soon-to-be-born calves will be at risk as bears come out of their dens in March and April. You wouldn’t call Bradley a fan of grizzly bears, but she does hold a slightly different opinion than her dad and others on the front when it comes to what will happen when the threatened species is delisted from federal protections.

“I think another part of the challenge is convincing these people that even if they’re delisted, they’re not going to go away. They’re not going to disappear from the landscape,” Bradley says.

Bradley says ranchers need to learn to live with that. She’s trying to have more of that education come from a group of people ranchers may be more willing to listen to — other ranchers.

Mike Madel is a grizzly biologist with Montana Fish, Wildlife and Parks and he says bears can now be seen past Interstate 15, which is 40 miles from the mountains. And he says they’re not just traveling there in the spring, summer and fall.

“Most bears do return to the Rocky Mountain Front and excavate a den up high. There are some female grizzly bears that are starting to hibernate, dig dens and hibernate out in those wild, remote high-plains and riverbottom habitats,” Madel says.

Madel says there’s a larger diversity of food sources on the plains and because of that, this new generation of cubs will likely be more reproductive, accelerating the population’s growth. Madel has worked to write grants to fund conflict mitigation tools for ranchers and farmers closer to the mountains for years, but he says the need is growing in outlying ranching and farm communities.

“And it’s really becoming part of an issue for us. And I didn’t have to deal with a lot like providing farmers with bear proof grain bin doors,” Madel says.

That’s why FWP recently hired a grizzly bear conflict specialist to help Madel with the workload. He adds that rancher-led efforts like Trina Bradley’s will help get people reluctant to work with government agencies on board.

Bradley agrees and says

ranchers need to feel supported with education but also with the cost of reducing bear conflicts.

“Funding is always a huge barrier. Electric fencing costs money, dogs cost money, everything costs a lot of money, not just for the initial set-up, but for the maintenance,” Bradley says.

Bradley and the Blackfoot Stockgrowers Association have been holding meetings across the Rocky Mountain Front trying to convince ranchers focused on delisting to turn their attention to finding ways to reduce runs with bears. But tools to do that are expensive. A trained guard dog could run \$5,000 or more and an electric fence around a calving lot can easily cost over \$10,000 depending on the size. That price tag can be a huge turnoff to ranchers already having a hard time staying in the black.

Bradley hopes the meetings will catapult efforts within the stockgrowers association to compete for grant dollars from state and federal agencies and nonprofits. She’s also asking ranchers to get out there and tell their stories in order to let the public know what they’re dealing with.

“Ranchers are very private people and we don’t want to talk about what’s going on out here because it’s nobody’s business. But it’s to the point where we need to talk about it and to tell our story,” Bradley says.

The private land trust group Heart of the Rockies Initiative works to fund several local ranching and farm groups working on living with bears. Garry Burnett is the group’s executive director.

“So let’s move into how to maintain grizzly bear populations, and how to maintain these livestock operations. I’ve heard landowners says this: we can do both,” Burnett says.

He says there are success stories of ranchers and bears coexisting, it’s been happening in the Blackfoot Valley for years.

On the Two Creek Ranch east of Ovando, members of local conservation groups and the U.S. Fish and Wildlife Service are working together to unwind and set up about a mile of fladry. It’s an electrified wire with red flags attached to it meant to scare wolves away, which ranch manager Wayne Slight says is one of his main issues these days.

But he hasn’t had a grizzly kill one of his cows for about 20 years.

“When you get your first depredation, emotions are very high, you’re upset with the world and want to go kill all the bears and that can’t happen. You gotta get over that and move onto the fact of what you can get done,” Slight says.

After the first time a bear killed one of his livestock, Slight received funding from various nonprofits and government agencies for a roughly \$17,000 six-wire electric fence around his calving lot. He’s funded more electric fencing himself and installed shipping containers to lock up grain and minerals.

“The bears did tear all the wooden doors off of all of our storage bins,” Slight says.

Slight was an early adopter of some of these tools and over time, his neighbors took notice. He says local conservation group Blackfoot Challenge has been key in getting ranchers to the table.

CALENDAR

lin@shepherds-extravaganza

THURSDAY-SUNDAY, APRIL 23-26

California FFA State Convention Canceled: Anaheim Convention Center, 800 W Katella Ave., Anaheim, Calif. California’s FFA members will meet and compete and demonstrate their knowledge of agriculture. Website: <http://www.calaged.org/stateconvention>

FRIDAY, APRIL 24

Women in Ranching WIRED Program: Yolo Land and Cattle Co., Woodland, Calif. The Northern California Women in Ranching WIRED symposium will be held on April 24 at Yolo Land and Cattle Co. in Woodland, Calif. Speakers who are experts in their field have agreed to share their knowledge with participants. Contact: Leanne Brown, 530-598-4444, sisqbrown@gmail.com

SATURDAY-SUNDAY, APRIL 25-26

Oregon Ag Fest Canceled: A family-oriented weekend full of fun-filled activities that will help children — and their parents — learn about Oregon agriculture. See you next year — April 24-25, 2021. Online: <http://oragfest.com/>

THURSDAY-SATURDAY, MAY 14-16

Washington FFA State Convention: Washington State University, Pullman. Washington FFA members will meet and compete, displaying their knowledge of agriculture. Website: <http://www.washingtonffa.org>

SUNDAY-TUESDAY, MAY 17-19

The Alltech Ideas Conference:

Central Bank Center, 430 W. Vine St., Lexington, Ky. The 36th Alltech Ideas Conference will explore innovative solutions within the global food-supply chain. More than 40 topics are slated for discussion. Website: <http://one.alltech.com>

WEDNESDAY-THURSDAY JUNE 3-4

Stockmanship Clinic: 8 a.m. Pendleton Convention Center, 1601 Westgate, Pendleton, Ore. This hands-on clinic will focus on practical applications of various livestock handling techniques, why low stress handling is important and helping to design a livestock handling facility for a local ranch. Sponsored by Roots of Resilience and Oregon State University Extension. Contact: Andrea Mann at 509-670-7743 or mannandrea@aol.com, or Beth Robinette at beth@lazyrbeef.com

Submit upcoming ag-related events on www.capitalpress.com or by email to newsroom@capitalpress.com.

FRIDAY, APRIL 3

Biodiversity Conservation Practices Conference: 9 a.m.-4 p.m. LaSells Stewart Center, 875 SW 26th St., Corvallis, Ore. A conference on practices that conserve agricultural biodiversity and their benefits in western farming systems for conservationists, farmers and other agricultural professionals. Website: <https://bit.ly/2OIdtYw>

SATURDAY, APRIL 4

Farm Fest and Plowing Competition: 10 a.m.-4 p.m. Yamhill Valley Heritage Center, 11275 SW Durham Lane, McMinnville, Ore. Yamhill County Historical Society and the Oregon Draft Horse Breeders Association present Farm Fest and Plowing Competition, the larg-

est plowing competition with draft animals on the West Coast. Contact: Raylinda Price, 503-472-2842, events@yamhillcountyhistory.org

FRIDAY, APRIL 10

AgForestry Class 41 Graduation Postponed: The celebration the AgForestry Leadership Program’s 41st Class will be rescheduled. Contact: Melissa Skomer-Kafton, 509-926-9113, melissa@agforestry.org Website: <http://agforestry.org/graduation-class-41/>

THURSDAY-SUNDAY, APRIL 16-19

Shepherd’s Extravaganza: All day, Spring Fair, Washington State Fairgrounds, 110 9th Ave. SW, Puyallup, Wash. There will be top quality fleeces and sheep for sale, demonstrations, classes, fiber vendors, and sale of used equipment. Contact: Lin Schwider, 425-432-3455. Email:



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