

Research finds 'sweet spot' for plant transpiration

New study may help farmers irrigate more efficiently by looking at the rate of transpiration in plants

By **GEORGE PLAVERN**
Capital Press

A new study in the journal *Nature Ecology & Evolution* may help farmers irrigate crops more efficiently, with a better understanding of how much water is actually used beneficially by plants in a given environment.

Researchers analyzed data from 45 field stations representing different climates around the world, from jungles to deserts, trying to determine the optimal rainfall at which plants are most productive before water is lost to evaporation or runoff.

While the study was not tailored specifically to irrigation, lead author Stephen Good at Oregon State University said the findings do have a practical link to agriculture.

"If you're irrigating a field, you want to make sure the water you're putting on is actually being used, and not just being evaporated off," Good said.

The study is based on mea-

suring transpiration, or the process by which moisture is carried through plants from the roots to the leaves, where it changes to vapor and is eventually released back into the atmosphere.

Good, a hydrologist and assistant professor at OSU, said transpiration is the part of the water cycle that is most linked to the productivity of plants.

"When you think of water as a resource, transpiration is the total amount of water a plant is able to use," Good said.

Despite its importance, Good said transpiration is poorly understood. What the study finds is a general relationship between transpiration and climate — that essentially there is a "sweet spot" for rainfall, not too wet and not too dry.

"You tell me the climate and aridity in that climate, and I can tell you how much water the plant can use in transpiration," Good summarized.

With that information, growers could make key management decisions such as cropping systems and irrigation rates to maximize yield while reducing input costs.

Good said researchers are now conducting similar studies on the ground in some of Eastern Oregon's more arid climates, including Hermiston, Milton-Freewater, Dufur, Maupin and Madras.

Georgianne Moore, co-author of the study and an asso-



Georgianne Moore, Texas A&M AgriLife

Researchers at Oregon State University, Texas A&M and Ghent University studied plant water use on a global scale across all climates.

ciate professor at Texas A&M University, said their modeling shows how rainfall is split between plant use, evaporation, runoff and interception, where water doesn't actually make it into the soil.

"We produced a map based on the model to show what parts of the world will fall

off the curve and no longer use their rainfall as efficiently for beneficial growth," Moore said in a statement released through OSU.

One other wrinkle in the equation is climate change, which Moore suggests will continue to shift away from intermediate climates and

more toward extremes, with wet areas getting wetter and dry areas getting drier.

"There could be big consequences, as it will affect forests, grasslands, savannas and deserts," Moore said. "Scientists can now use the model we have to help make predictions about the future of these

plant communities." Changing climates and transpiration could significantly influence agricultural systems as well, Good said.

"If we move to a drier climate, or if the climate changes in Oregon, we can expect a decrease in the transpiration of plants," he said.

Eastern Oregon commissioners weigh in on forest plan in D.C.

By **KATY NESBITT**
For the Capital Press

ENTERPRISE — Eastern Oregon county commissioners were to make their voices heard Dec. 12-14 when Pacific Northwest Regional Forester Jim Peña presented the Blue Mountains Forest Plan Revision in Washington, D.C.

The Blue Mountains Forest Plan has been under revision since 2003 and is a guiding document for the Malheur, Umatilla and Wallowa-Whitman national forests. Susan Roberts, chairman of the Eastern Oregon Counties Association, said a draft of the plan released in June had changes in grazing requirements from a draft released in January.

"We were concerned that those changes would have an economic impact on our local communities," Roberts said.

Fearing increased stubble height along endangered species-bearing streams in public grazing allotments would reduce grazing and harm local economies, Harney County Commissioner Mark Owens and other members of the

association asked Rep. Greg Walden, R-Hood River, to intervene on their behalf with the federal agencies.

"We want to make sure they are addressing economic conditions as well as ecological in the plan's revision," Owens said.

Roberts said the association members wanted an opportunity to speak to federal fisheries staff face-to-face instead of communicating through the Forest Service.

"The plan had not gone to formal consultation with the regulatory agencies and we wanted to get some things ironed out before that," Roberts said.

Justin Discigil, Walden's communications director, said the congressman has worked with Eastern Oregon counties throughout the 14 years the Blue Mountains Plan has been under revision.

Discigil said Walden, at the association's behest, raised the counties' concerns about the Blue Mountains Plan with the new chief of the Forest Service, Tony Tooke, shortly after he was appointed

this fall.

Seeing significant headway in meetings with the federal agencies, Wallowa County Commissioner Todd Nash said he asked if Eastern Oregon could send a representative to meet with Forest Service officials when Peña presented the plan to Forest Service leaders in Washington, D.C.

"When we started to see effective changes with all of the agencies in the room I thought it was of value, as cooperating agents, for someone from one of the counties to be in that presentation," Nash said.

Peña extended an invitation for one commissioner to join him in Washington.

"It's important for our agency to be transparent about this process and everything it entails, so I was happy to extend this invitation," Peña said. "Many of these counties have signed a memorandum of understanding to formalize their role as a cooperating agency with the Forest Service as part of this forest plan revision, and all of them are important partners in this effort."

Ranchers buoyed by decision to delay grazing rate formula vote

By **SEAN ELLIS**
Capital Press

FORT HALL, Idaho — News that the Idaho Land Board had delayed a decision on whether to revise the grazing rate formula on state endowment land was viewed as a positive sign by ranchers attending Idaho Farm Bureau Federation's annual meeting.

IFBF members submitted the majority of public comments on the issue.

The land board voted 5-0 Dec. 5 to put off a decision on the grazing formula, which hasn't been revised since 1993 and was \$9.01 per animal unit month this year.

An AUM is the amount of forage needed to feed a cow and calf for a month. The IDL manages 1,139 grazing leases on 1.4 million acres of state endowment land, representing a total of 257,370 AUMs.

An Idaho Department of Lands subcommittee and advisory group has been reviewing the methodology of the grazing rate formula.

Four alternative formulas, in addition to the current one,

are on the table and some cattle ranchers worry the alternatives could result in a significant increase in the grazing rate on state land.

The vast majority of public comments received by IDL have recommended keeping the current grazing rate formula. Most of those comments have been submitted by farm bureau members.

Cody Chandler, a Weiser rancher, said cattlemen have come forward late in the game to make their voices heard on the issue "and I appreciate the fact that the land board stepped back and they are going to look at this a little bit harder."

During its regular meeting Dec. 5, the land board met in executive session to discuss new information about the proposed alternatives, Secretary of State Lawrence Denney told Capital Press.

The executive session lasted more than an hour.

"There was new information that was brought to our attention and we wanted to make sure we considered everything before making a de-

cision," Denney said.

He said the land board will likely wait until after the 2018 Idaho Legislature adjourns before taking up the issue again. Idaho's legislative session usually wraps up about the end of March or first of April.

"That will give us more time to collect additional information," Denney said.

Russ Hendricks, IFBF's director of governmental affairs, said much of the discussion on the issue has centered on the state grazing rate not tracking with the private land grazing rate but that's not a fair comparison.

The average grazing rate on private land in Idaho was \$18 this year.

Private land grazing leases typically include a lot of services that are not included with public land leases, such as fencing, water development and maintenance, labor and predator and noxious weed control, Hendricks said.

"When you add in all the additional (services) over and above the lease rate, the state rate is already way above the private lease rate," he said.

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