

## People &amp; Places

## In search of sustainability

By **GEORGE PLAVEN**  
Capital Press

CORVALLIS, Ore. — For Chad Higgins, the “aha” moment came purely by chance.

Higgins, an associate professor of biological and ecological engineering at Oregon State University, was walking casually past a 6-acre sheep pasture near campus in 2015 when he observed something peculiar.

Two years earlier, the university had installed a solar array on the land, generating 1,435 kilowatts of renewable electricity. It was never meant for research, but Higgins’ scientific mind couldn’t help but notice how much greener and more lush the grass was growing in the shade beneath the panels.

“You could literally see ecological differences as a result of the installation,” Higgins said.

The discovery led Higgins and his team at the Nexus of Energy, Water and Agriculture Laboratory, or NEWAg, to begin studying how solar installations can make conventional farms more profitable and sustainable, from powering electric tractors to conserving water in low-rainfall areas.

Now Higgins has his sights set on establishing what he calls “the Disneyland of sustainable agriculture,” a research farm where growers, developers and academics can put these bold concepts to the test.

Called the Staterra Center, the name is derived from the Latin words “statera,” meaning balance, and “terra,” meaning Earth.

“We have an opportunity to do good,” Higgins said. “We have an opportunity to provide stable and additional revenue streams to American family farms. We have an opportunity to make sure we don’t run out of food in the future.”

### Practical research

By his own admission, Higgins is not the most likely person to be designing farms of the future.

Higgins grew up in rural upstate New York before heading to Cornell University, where he graduated in 2000 with a bachelor’s degree in agricultural and biological engineering. He later earned his master’s degree and doctorate in mechanical and environmental engineering from Johns Hopkins University in Baltimore.

At that point, Higgins was studying turbulence and



George Plaven/Capital Press

**Chad Higgins, associate professor of ecological and biological engineering at Oregon State University and director of the Nexus of Energy, Water and Agriculture Laboratory, is aiming to build a research farm called the Staterra Center to experiment with sustainable farming technology.**

fluid mechanics — interesting subjects, he said, though highly technical and their significance was difficult to explain.

“I wanted to do something more practical,” Higgins said. “I wanted the research I did to be close enough to an implementable reality that I could explain it to my grandma....”

In 2007, Higgins left the U.S. for Europe to work at the École Polytechnique Fédérale de Lausanne in Switzerland. There he taught classes and helped to develop computer codes that could track Alpine hydrology and better predict avalanches.

After four years overseas, Higgins said he began feeling homesick. He saw OSU was hiring an irrigation specialist, and decided to apply despite his limited training.

“By some miracle, I was able to make the case that what I had learned could be applied to irrigation,” he said.

One of Higgins’ first visits in Oregon was to the recently built Shepherds Flat Wind Farm in rural Gilliam and Morrow counties along the Columbia River. Starting across a maze of wind turbines covering 30 square miles, Higgins made his first connection between renewable energy and its effects on farmland.

“I asked the simple question: Do the wind turbines affect the irrigation demand of most fields?” Higgins said. “That’s the day I founded the NEWAg Laboratory.”

### Agrivoltaic systems

As director of the NEWAg Lab, Higgins and five post-graduate students examine how food, water and energy intersect — whether through technology, public policy or

general farm practices.

The researchers published their first paper on wind energy in 2015, which showed that turbines at Shepherds Flat did increase water evaporation by about 10%. However, Higgins said the paper was “woefully and totally” ignored.

After Higgins took his serendipitous walk past the 35th Street Solar Array, he knew right away the lab needed to pivot from studying wind to solar.

Using a combination of meteorological equipment and soil moisture sensors, the lab spent months analyzing conditions in the pasture. What they found was grass beneath the solar panels used water 300% more efficiently, growing 90% more forage for livestock grazing.

“It was a massive improvement in water efficiency and productivity,” Higgins said.

The idea of co-developing land for farming and solar panels — known as agrivoltaics — is nothing new. German physicists were first to propose the concept in 1981.

“You essentially treat light as a farm resource that you manage, and don’t just take as it’s given,” Higgins said. “You put light, or sun, in the same class as you put water and fertilizer, for example, something you actively manipulate for agronomic benefit.”

Essentially, there is a maximum amount of light that plants can convert into sugars, Higgins explained. Just like people sweat in the hot sun, plants also use more water to cool themselves under stress.

Rather than apply more irrigation, Higgins said solar panels can create the shade

that plants need to grow more efficiently, while also producing valuable electricity that can be used on the farm.

Higgins has a few ideas where the electricity can be used for even greater environmental benefits. It could go toward electrifying farm machinery, such as tractors, lowering diesel fuel emissions. Or it could replace burning natural gas in the process required to make nitrogen fertilizer.

Either way, Higgins said agrivoltaic systems could be key to helping farms go from a net carbon producer to net carbon-negative.

“The efficiency gains we get from technology, coupled with all the other benefits of light management, are all the ingredients we need for a sustainable farm,” Higgins said.

### Staterra Center


The most recent study published by NEWAg shows that solar power has the highest productivity when placed on farmland.

Higgins said the results prove that, if just 1% of agricultural land was converted to agrivoltaics, it would be enough to offset global energy demand.

“Energy security, food security and water security are all pushed in the proper direction under that scenario,” he said.

The question then becomes how farmers and ranchers can configure the systems and interpret the data to make management decisions without interrupting normal operations. That is what Higgins hopes to answer with the Staterra Center.

“I don’t expect anyone to



**Western  
Innovator**

**CHAD HIGGINS**

**Age:** 41

**Hometown:** Scio, Ore.

**Family:** Wife, Patti

**Occupation:** Associate professor, Oregon State University Department of Biological and Ecological Engineering; director, Nexus of Energy, Water and Agriculture Laboratory (NEWAg)

**Education:** Bachelor’s degree in agricultural and biological engineering, Cornell University, 2000; master’s degree in mechanical engineering, Johns Hopkins University, 2005; doctorate in environmental engineering, Johns Hopkins University, 2007

Established 1928

### Capital Press Managers

Joe Beach ..... Editor & Publisher  
Kevin Blodgett ..... Advertising Director  
Carl Sampson ..... Managing Editor  
Jessica Boone ..... Production Manager  
Samantha McLaren ..... Circulation Manager

Entire contents copyright © 2019  
EO Media Group  
dba Capital Press

An independent newspaper  
published every Friday.

Capital Press (ISSN 0740-3704) is  
published weekly by EO Media Group,  
2870 Broadway NE, Salem OR 97303.

Periodicals postage paid at Portland, OR,  
and at additional mailing offices.

POSTMASTER: send address changes to  
Capital Press, P.O. Box 2048 Salem, OR  
97308-2048.

### To Reach Us

Circulation ..... 800-781-3214  
Email ..... Circulation@capitalpress.com  
Main line ..... 503-364-4431

### News Staff

#### Idaho

Carol Ryan Dumas ..... 208-860-3898

#### Boise

Brad Carlson ..... 208-914-8264

#### Central Washington

Dan Wheat ..... 509-699-9099

#### Western Washington

Don Jenkins ..... 360-722-6975

#### Eastern Washington

Matthew Weaver ..... 509-688-9923

#### Oregon

George Plaven ..... 406-560-1655  
Mateusz Perkowski ..... 800-882-6789

#### Graphic artist

Alan Kenaga ..... 800-882-6789

#### Designer

Randy Wriughthouse ..... 800-882-6789

### To Place Classified Ads

Telephone (toll free) ..... 800-882-6789  
Online ..... CapitalPress.com/classifieds

### Subscriptions

Mail rates paid in advance  
Easy Pay U.S. \$4/month  
(direct withdrawal from bank  
or credit card account)

1 year U.S. .... \$55  
2 years U.S. .... \$100  
1 year Canada ..... \$275  
1 year other countries ..... call for quote  
1 year Internet only ..... \$49.99  
1 year 4-H, FFA students/teachers ..... \$30  
9 months 4-H, FFA students/teachers ..... \$25

Visa and Mastercard accepted

### To get information published

**Mailing address:**  
Capital Press  
P.O. Box 2048  
Salem, OR 97308-2048

**News:** Contact the main office  
or news staff member closest to you,  
send the information to  
newsroom@capitalpress.com  
or mail it to “Newsroom,” c/o Capital Press.  
Include a contact telephone number.

**Letters to the Editor:** Send your  
comments on agriculture-related public  
issues to opinions@capitalpress.com, or  
mail your letter to “Opinion,” c/o Capital  
Press. Letters should be limited to  
300 words. Deadline: Noon Monday.

### Capital Press ag media

CapitalPress.com  
FarmSeller.com  
MarketPlace.capitalpress.com  
facebook.com/CapitalPress  
facebook.com/FarmSeller  
twitter.com/CapitalPress  
youtube.com/CapitalPressvideo

### Index

Ag Finance ..... 8-9  
Dairy ..... 13  
Livestock ..... 12  
Markets ..... 16  
Opinion ..... 6

### Correction policy

Accuracy is important to Capital Press  
staff and to our readers.

If you see a misstatement, omission or  
factual error in a headline, story or photo  
caption, please call the Capital Press news  
department at 503-364-4431, or send  
email to newsroom@capitalpress.com.

We want to publish corrections  
to set the record straight.

## FFA students spearhead effort to collect 175 tons of food for needy

By **GEOFF PARKS**  
For the Capital Press

PERRYDALE, Ore. — The Perrydale High School FFA chapter’s 2019 Food For All program collected over 350,000 pounds of food for distribution to over 8,000 needy families throughout the Willamette Valley and the central coast.

The effort, now in its 21st year, is sponsored by the Lower Willamette FFA District. In addition to Perrydale, it includes Willamina, Dayton, Sheridan, Yamhill-Carlton, Central and Dallas. It is coordinated by Food For All program founder and retired Perrydale ag adviser Kirk Hutchinson and aided by Christina Griffin, Perrydale High’s FFA adviser.

Each year, Perrydale and the other

Lower Willamette FFA District schools collect, package and deliver fruits and vegetables to help provide food to families in need throughout the Willamette Valley and central coast.

Hands-on activities for Food For All participants at Perrydale High School begin with the opening of the school year. The chapter’s student ambassadors reach out through letters, emails and in-person presentations to local farmers, packers and related businesses, soliciting donations of food.

The food is collected by the students, teachers and adult volunteers over two days in early December. It is packaged into donated totes full of family-sized food bundles of potatoes, pears, onions, apples, oranges, parsnips, beets, turnips, squash and other fresh produce. The packages are dis-

tributed through Dec. 23, said Aleyah Mauk, 16, the chapter’s vice president.

“Kindergartners through seniors here at the school help in this project,” Mauk said, from packaging the individual family bags to moving pallets and loading trucks. Any leftover food is donated to local food banks, she said.

Griffin said because of the limited space at Perrydale, she didn’t think they were going to be able to take in much more product than the 350,000 pounds collected.

Nothing is guaranteed in terms of food promised and food received for distribution. Hutchinson just smiled and said things usually work out. When a large donation of vegetables was scrubbed early in December, another commodity donation was boosted by the provider.

Food For All is becoming a well-oiled machine, he said.

“We’re getting more organized with more schools, being able to do more things,” Hutchinson said. “Northwest Farm Credit Services gave us a grant and we got our own labeled bags for the first time.”

The 1,000-pound-capacity cardboard totes were donated by a packing house in Clackamas, and a forklift was made available for moving them from the school to a delivery truck.

“We always like volunteers,” he said. “NW Farm Credit sent 20 staff from their Salem office to help us pack food for a day, and we have 20 different volunteers that do our trucking and our transportation for the 15 pickups and 40 deliveries of the packaged food.”

## CALENDAR

Submit upcoming ag-related events on [www.capitalpress.com](http://www.capitalpress.com) or by email to [newsroom@capitalpress.com](mailto:newsroom@capitalpress.com).

### MONDAY, JAN. 6

**Idaho Range Livestock Symposium:** 8 a.m., American Legion Hall, Marsing, Idaho. Adapting to a changing rangeland environment. Registration is required. Contact: Scott Jensen, 208-894-4104, [scottj@uidaho.edu](mailto:scottj@uidaho.edu) Website: <https://bit.ly/2DMjyIR>

### TUESDAY JAN. 7

**Idaho-E Oregon Alfalfa and Clover Seed Growers Meeting:** 8 a.m., Caldwell Elks Lodge, 1015 N. Kimball Ave., Caldwell, Idaho. Alfalfa and clover seed growers from Eastern Oregon, southwest Idaho and the Magic Valley of Idaho will have

their annual meeting. Contact: Benjamin Kelly, 208-888-0988, [benjamin@amgidaho.com](mailto:benjamin@amgidaho.com)

**Idaho Range Livestock Symposium:** CSI Herrett Center, 315 Falls Ave., Twin Falls, Idaho. Adapting to a changing environment. Registration required. Contact: Benton Glaze, 208-736-3638, [bglaze@uidaho.edu](mailto:bglaze@uidaho.edu) Website: <https://bit.ly/2DMjyIR>

### WEDNESDAY JAN. 8

**Idaho Range Livestock Symposium:** 8 a.m., Bannock County Veterans Memorial Building, 300 N Johnson Ave., Pocatello, Idaho. Adapting to a changing environment. Registration required. Contact: Benton Glaze, 208-736-3638, [bglaze@uidaho.edu](mailto:bglaze@uidaho.edu) Website:

<https://bit.ly/2DMjyIR>

### THURSDAY JAN. 9

**Idaho Range Livestock Symposium:** 8 a.m., BYU-Idaho Ag. Science Center, 525 S Center St., Rexburg, Idaho. Adapting to a changing environment. Registration required. Contact: Benton Glaze, 208-736-3638, [bglaze@uidaho.edu](mailto:bglaze@uidaho.edu) Website: <https://bit.ly/2DMjyIR>

### THURSDAY-FRIDAY JAN. 9-10

**Oregon Mint Growers Annual Meeting:** 8 a.m. Salishan Resort, 7760 North Highway 101, Glenden Beach, Ore. Make your plans to attend the 71st annual meeting, where you’ll hear the latest on the mint industry. Contact: <http://oregonmint.org>, 503-364-2944

### TUESDAY, JAN. 14

**Introduction to Food Safety & HACCP Workshop:** 8 a.m. U of I Food Technology Center, 1902 E Chicago St., Caldwell, Idaho. This is a one-day overview course designed for line workers, QC personnel, sanitation professionals, supervisors, and other employees of food processing operations. Participants will spend part of the day learning about food safety prerequisite programs, which are used to ensure food products are free from non-hazardous objectionable contaminants. Cost: \$355 Website: <https://bit.ly/2DJ5OSP>

### WEDNESDAY, JAN. 15

**Farm and Ranch Succession Planning Workshop Series:** 1-4 p.m. Multnomah Grange No.

71, 30639 SE Bluff Road. Gresham, Ore. Register now for this free series of workshops on farm and ranch succession. Workshops are held every other Wednesday from Jan. 15 to Feb. 26 In addition to these courses, no-cost, confidential, one-on-one business counseling is provided free by an experienced Farm and Ranch Small Business Development Center adviser. Let us help you identify issues and evaluate options in passing your farm and business on to the next generation. A complimentary light lunch is provided at 12:30 p.m. There is room for 50 people. Presented by: Clackamas Small Business Development Center and the East Multnomah & Clackamas Soil & Water Conservation Districts. Questions? Call Diana Tourney at 503-594-0732.