Summer 2020

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For questions or comments, please contact Maurice Pitesky at 530-752-3215 or mepitesky@ucdavis.edu

Does Livestock Grazing Benefit Organic Crops? Multistate Research Team Explores Jmpacts

Livestock grazing could be beneficial for organic farming systems. To see if the practice poses any food safety risks, university, government and nonprofit partners will receive a nearly \$1 million U.S. Department of Agriculture <u>Specialty Crop Multistate Program</u> grant to study the impacts of livestock grazing of cover crops on bacterial population dynamics, soil building and environmental health.

"Fresh produce growers and their advisors will benefit from learning about the impacts of integrating livestock grazing with winter cover crop management on soil health including soil organic matter, nutrient cycling and reduced nitrate leaching, and potential food safety risks discovered in this project to make decisions on adop-

tion, management, and environmental benefits of winter cover crop management in annual vegetable systems," said <u>Alda Pires</u>, University of California Cooperative Extension specialist in the UC Davis School of Veterinary Medicine and principle investigator in the study.

The \$999,985 project, titled "Evaluating the food safety impacts of cover-crop grazing in fresh produce systems to improve cover crop adoption, crop-livestock integration, and soil health," is being led by the University of California in partnership with The Organic Center, USDA's Agricultural Research Service, the University of Maryland Eastern Shore, the University of Minnesota and California Department of Food and Agriculture.

Livestock grazing of cover crops could be beneficial for organic systems because it maximizes the strengths of cover cropping, including enhanced soil fertility, structure, water infiltration and storage, and reduced nitrate leaching, while addressing challenges that have limited the expansion of cover crop use. These challenges include concerns over cover -crop water use and nutrient immobilization, which could result in nutrient deficiencies and increase input costs for the crops that follow.

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UC Davis researcher Alda Pires has received a new grant to study affects of crop-livestock integration.

Does Livestock Grazing Benefit Organic Crops? Multistate Research Team Explores Jmpacts cont.

Many growers consider livestock grazing of cover-cropped fields in fresh produce operations as a way to enhance soil health and environmental benefits by increasing carbon inputs and nutrient cycling.

"This study will allow farmers to complement the benefits of both cover cropping and livestock integration into cropping systems," said Jessica Shade, The Organic Center's director of science programs. "Like cover cropping, integrating animals into cropping systems can be beneficial to farm environmental impacts and profitability by improving nutrient cycling, reducing dependence on external inputs, improving soil health and diversifying profit streams."

Despite the well-known benefits of animalcrop integration, concerns over microbial food safety are limiting the expansion of animal integration into cropping systems. Recent research has shown that integrated crop-animal systems <u>perform well in keeping pathogens</u> <u>out of meat</u>, but additional research is needed to examine the synergistic impacts of the use of livestock for cover crop grazing on ecosystem health and food safety.

This project will fill this research need by examining food pathogen persistence and survival in soil and transfer to vegetable crops, and the relationship between soil health properties, environmental factors and pathogen survival in grazed cover crop-vegetable production in three states.

The researchers will graze sheep in covercropped fields before planting spinach and cucumber. They will measure changes in soil health indicators over two years of grazed cover crop-vegetable production and assess benefits and potential tradeoffs of vegetable cash crop productivity. The results will be compared to vegetable fields planted in tilled cover crops and a fallow field.

Pires' research team is multi-institutional, multiregional and interdisciplinary, including:

- <u>Michele Jay-Russell, Western Center for</u> <u>Food Safety, UC Davis</u>
- <u>Nicole Tautges, Agricultural Sustainability</u>
 <u>Institute, UC Davis</u>
- <u>Amelie Gaudin, UC Davis</u>
- Patricia Millner, USDA-ARS
- <u>Fawzy Hashem, University of Maryland-</u> <u>Eastern Shore</u>
- Paulo Pagliari, University of Minnesota
- Jessica Shade, The Organic Center

The Organic Center will lead outreach efforts focusing on the benefits of grazing and food safety impacts such as online tools, outreach events, conference presentations, and publications targeted to growers, policymakers and consumers.

UC Agriculture and Natural Resources brings the power of UC research in agriculture, natural resources, nutrition and youth development to local communities to improve the lives of all Californians. Learn more at <u>ucanr.edu</u>.

CONTACT: Pam Kan-Rice, (510) 206-3476, <u>pam.kanrice@ucanr.edu</u>

Alda Pires

Upcoming Webinar!

POST-FIRE SOIL SAFETY

Learn how wildfire impacts the safety of garden soil, produce, & eggs Check out this upcoming webinar!

Speakers will address questions on growing produce or raising poultry in post-fire impacted areas.

To Register, visit: ucanr.edu/postfiresoilsafety

For more info, visit our website at:

ucanr.edu/sites/poultry/

Answer from last issue: How do Japanese Honeybees fight off giant hornets?

By turning the heat up: When an intruding giant hornet enters the nest of the Japanese honeybees, they swarm the invader and begin vibrating. This collective vibration raises the temperature to 117°F, just 2° more than the hornet can tolerate. The bees manage to fry the invader before it can lead more scouts back. European honeybees lack this defense mechanism, and are vulnerable to hornet attacks. (*National Geographic*)

Want to see more? Check out this cool video via National Geographic: https://www.youtube.com/watch?v=R5QxUR-mZVM

(Images: National Geographic)

Seeking Stakeholders for Avian Influenza Waterfowl Tracker Advisory Group

Recently UC Davis Vet Med Extension, USGS and the University of Delaware received a 4-year USDA grant titled "*Real-time Waterfowl Mapping Web Application: Validating a Critical Tool for a New Era of Avian Influ-*

enza Surveillance to Improve Food Security in Commercial Poultry".

This project builds off of a 3-year UC -ANR project to further develop sensing remote technologies inweather cluding radar, satellite imagery and telemetry of waterfowl to waterfowl map habitat in close proximity to commercial poultry in the Central Valley of California and Delmarva the Peninsula in Delaware (both large poultry growing areas). In addition



Screenshots from the California Waterfowl Tracker. The figure on he left shows a tool that makes daily predictions on waterfowl location and density between November and March using satellite imagery. The figure on the right shows historic radar data of waterfowl roosting. The tool will be expanded to the Delmarva Peninsula along the Atlantic Coast. We are seeking industry and government stakeholder for an advisory group to make the app more useful to the poultry industry.

and read the article on detecting avian influenza in California wetlands targeted via remote sensing <u>here</u>.

Our goal is to develop a "real-time" mapping

tool that allows stakeholders the ability to better understand their proximity to waterfowl and AIV in the environment. If successful, we hope to expand the system across the U.S.

What we need: We need stakeholders (industry and government) who can meet 1-2x a year to provide feedback on the functionality of the web-tools we are developing. Our goal is to make the tools practical and easy to use as currently. they are not. We will be of-

the project leverages our previous UC-ANR research on detection of avian influenza virus (AIV) in wetlands using ultrafiltration and a novel PCR approach refined in Sam Diaz's lab at UCD that is more able to detect the wide range of AI viruses in the environment vs standard approaches.

You can visit the California Waterfowl Tracker

fering an annual \$300 honorarium for up to 3 hours of work (a maximum of two 1.5 hr meetings per year).

If interested please contact Brian Ladman (<u>bladman@udel.edu</u>) and/or Maurice Pitesky (<u>mepitesky@ucdavis.edu</u>).

Brian Ladman and Maurice Pitesky

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Practical Tools to Reduce Risk of RHDV2



Researchers at UC Davis developed risk assessment tools to help improve biosecurity and prevent occurrence of RHDV. (Image: USDA flickr (20110505-RD-LSC-0846))

Rabbit Hemorrhagic Disease Virus (RHDV)

is an extremely contagious viral disease that causes severe illness and death in the European rabbit (*Oryctolagus cuniculus*), the only rabbit species to be widely domesticated globally. Referred to as "classical" RHDV, the disease is thought to have emerged in the 1970s in Europe. Since that time, RHDV has become widely distributed throughout Europe, Asia, Africa, Australia and New Zealand, with isolated cases also appearing in North America. A new variant of the virus, RHDV2, was discovered in 2010 in France and has subsequently been found worldwide. RHDV2 affects rabbits that were immune to the "classical" RHDV. Rabbits can contract RHDV or RHDV2 through direct contact with infected animals or indirect contact with contaminated feed, bedding, or equipment. The virus is very stable and can last outside the animal host for several months in various climates. In the most recent outbreak of RHDV2 in the Southwestern U.S. it was discovered that not only are domestic and feral European rabbits susceptible to the disease, but wild rabbits and possibly pikas, too. Controlling the disease in wild rabbit populations poses serious challenges and highlights the critical importance of practicing proper biosecurity to mitigate disease transmission within domestic rabbit populations.

Practical Tools to Reduce Risk of RHDV2 cont.

In California, rabbits are raised for meat, wool, pelts, and as pets and show animals. According to the U.S. Census of Agriculture, the demand for rabbit meat continues to grow. You may find products sold at upscale restaurants, farmers markets, and ethnic markets. In California, 4-H youth can learn the basic principles of animal science and husbandry, community leadership, and business management by raising a rabbit. Just this past year (2019-2020) over 9,400 youth enrolled in rabbit projects in California alone.

To help raise awareness about RHDV and the current RHDV2 outbreak, Drs. Rosie Busch and Martin Smith from Veterinary Medicine Extension (VMEX) at the University of California-Davis developed a set of risk assessment tools to help rabbit owners and exhibition venues evaluate the gaps in their biosecurity on their home premises and at exhibition venues. On June 25, 2020, VMEX, in collaboration with California 4-H, hosted a webcast where Busch and Smith provided a review of RHDV and the principles of biosecurity while explaining to 4-H youth, volunteer educators, and staff how to use the risk assessment tools. For a recording of the webcast please go to <u>https://youtu.be/d6LwelX_dt4</u>. Additionally, the biosecurity risk assessment tools are available on the California 4-H homepage (<u>http://4h.ucanr.edu/</u>).

Rosie Busch and Martin Smith



(Image Credit: GK Hart/Vikki Hart/The Image Bank/Getty Images)



All of the terms are based on the articles in this edition



Down:

- 1. A word for geese and ducks
- 3. The practice of keeping our animals/plants happy and healthy
- 4. All of us together create a —
- 5. "I'm late, I'm late! For a very important date! No time to say 'hello, goodbye,' I'm late, I'm late, I'm late!"
- 7. In orbit I can tell you what the weather's like
- 8. A favorite past time for cows and sheep
- 9. Turkeys and -

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Across:

- 2. Cultivating crops and raising livestock equals -
- 6. Grown for profit or provisions
- 10. Another word for longevity and/or feasibility
- 11. Bacteria or viruses or other microorganisms that can cause harm
- 12. Domesticated animals raised in an agricultural setting

UC Davis & CDFA Want Your Jdeas on Preparing for the Next Poultry Disease Outbreak

As part of a recently granted 2-year USDA grant UCD titled "Preparation and

Response to Catastrophic Animal Disease: Removing Critical Obstacles to Readiness in the Western States" UCD is trying to improve emergency response to Foreign Animal Diseases (FADs) like virulent Newcastle Disease (vND) and Highly Pathogenic Avian Influenza (HPAI). By filling out a short on-line survey you can help California better respond to our next poultry disease outbreak. Recent outbreaks of HPAI and vND have resulted in mortality in the millions and millions of dollars of economic damage. When facing a FAD outbreak, the most effective action producers can take is to implement an emergency enhanced biosecurity plan. While some poultry facilities, particularly larger ones have already developed such emergency plans, many mid-sized and smaller ones have not. USDA, CDFA and UCD are partnering to develop tools to make it easier to create emergency plans.

In order to better understand what elements of response are needed a survey has been developed. The results of this survey will help direct efforts towards the most effective materials. Regardless of whether you work in the poultry industry, academic or regulatory communities your responses are important. This survey has only 20 questions and should only take about 15 minutes to complete. The survey is on-line and can be accessed by clicking <u>here</u>.

Mike Payne, Rodrigo Gallardo, Maurice Pitesky

If you have any questions about the survey or the project please contact Dr. Michael Payne at <u>mpayne@ucdavis.edu</u>

Check this out!

Poultry Webinar

Want to learn more about keeping your chickens happy and healthy? Or how to navigate poultry sales?

Topics

Navigating Direct to Consumer Sales of Poultry Products Relevant Poultry Diseases: What you Need to Know to Prevent em' Basics of Husbandry to Raise Healthy Birds



When: September 25, 2020 | 5:30-7:30 PM PST



Visit our website at <u>ucanr.edu/sites/poultry/</u>to Register!

UC Davis Pastured Poultry Farm Donates Chicken Coop to Farm Burned **by LNU Complex Fires**

ollowing the recent LNU Lightning Complex Fires, the UC Davis Pastured Poultry Farm donated one of their chicken coops to Eaton Ranch with the help of the Woodland-based Centers for Land Based Learning.

West of Vacaville, Eaton Ranch is home to a farming family of four who have 15 acres of walnuts and more than 30 laying hens. During the recent wildfires, their barn, storage sheds, and chicken coop burned down. Thanks to the collaborative efforts of CLBL and UC Davis, a coop was donated to within the week and the chickens now have a place to call home.

Madison Ekin, one of the owners said, "We can't even begin to describe how thankful we are for this act of kindness and generosity during these stressful times."

The UC Davis Pastured Poultry Farm is a collaborative project between the school of Engineering and the UC Davis School of Veterinary Medicine. The coop that was donated was co-designed and built by faculty and students alike, including Deb Niemierer and her student Ruby Yu from the College of Engineering.

Maurice Pitesky



^A Eaton Ranch following the recent fires.

- ^B Picking up the coop at the UC Davis Pastured Poultry Farm
- ^c Placing the coop at the Eaton Ranch for their laying hens.



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Maurice Pitesky, editor in chief

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