The Roundup
Livestock and Range Newsletter
Kern, Tulare, and Kings

University of California
Agriculture and Natural Resources

December 2017

It's the most wonderful time of the year…

Welcome to the Roundup! I hope you all enjoy the new look and feel of my newsletter. One of the changes you will notice is new authors. I am working with two recently hired Livestock and Natural Resource Advisors, Rebecca Ozeran (Fresno, Madera Counties) and Matthew Shapero (Ventura, Santa Barbara Counties) to write and publish each newsletter. In addition to including articles from Rebecca and Matthew, I will continue to feature guest articles from other contributing authors as I have done in the past. You will also find that articles are no longer broken up for formatting purposes. Each article will printed in the newsletter as a whole unit. No more flipping back and forth from page to page to find the last few sentences of an article. Hopefully this formatting change makes it even easier to read and follow the content.

Topics in this newsletter include:

- Modeling agriculture operations, an opinion article
- Wild Pigs, Psuedorabies, and Brucellosis
- NOW AVAILABLE – Wild Pig Pest Note
- Fig tree control
- Grazing post-herbicide application
- NOW AVAILABLE – Cow/Calf Cost and Return Study

As always if you have comments, questions, or would like to suggest a future newsletter article topic, please contact me. Happy Holidays everyone! Here's to Thanksgiving feasts, Christmas trees, and spending time with family.

Best wishes to all!

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Opinion: Models Help Us See The Big Picture of Sustainable Agriculture

by Holland C. Dougherty

As human population and per-capita income increase, demand for meat has also increased. At the same time, millions of people worldwide are food insecure, and with the environmental impacts of existing food production systems already under public and regulatory pressure, the big challenges for today's animal scientists are how do we make sure people have access to affordable, nutritious food now while minimizing the environmental impacts, both now and in the future? How do we calculate the impacts of what farmers are already doing, and see how different management strategies affect economics and the environment? These are the questions my work, and that of my colleagues in modeling of sustainable agriculture, are trying to answer.

First off, what is sustainable agriculture? The USDA defines sustainable agriculture as "*an integrated system of plant and animal production practices having a site-specific application that will, over the long term:*

- *satisfy human food and fiber needs;*
- *enhance environmental quality and the natural resource base upon which the agricultural economy depends;*
- *make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls;*
- *sustain the economic viability of farm operations; and*
- *enhance the quality of life for farmers and society as a whole."*

In other words, sustainable agriculture works to feed the current population, while ensuring that future generations benefit from a stable food supply and a healthy environment. Because of their ability to analyze and synthesize large amounts of data from a wide variety of sources, agricultural models are one of the best tools available to scientists interested in sustainability.

To see how we can improve in the future, we need to know how we are doing right now, both on the individual animal level and on the whole-system level. My research, and that of my colleagues, integrates knowledge from both levels to help producers and regulatory agencies understand the impacts of current systems as well as the effects of proposed changes. This saves time and money by informing decisions on how to balance the environmental and economic aspects of agriculture to benefit producers and consumers. Both levels of modeling are necessary to understanding agricultural

systems: animal-scale models can predict the performance of the average animal in a herd in a given production system, which helps producers decide how best to achieve their production goals. When that is combined with a larger framework that looks at the whole system, from animal emissions, to fuel used to bring feed to the farm, to energy used to create consumer-ready products, to it allows us to identify and target environmental impact hotspots where money and effort can be best invested.

Animal-scale models exist for many different species of livestock, and a specific type of system-level modeling, life cycle assessment, has been used to study a wide variety of products, such as beef, yogurt, almonds, and even wine! Life cycle assessment is an interesting method because it allows for the assessment of a wide variety of environmental impacts, such as carbon footprints, water use, global warming potential, and air and water pollution. When this is applied to animal agriculture, it allows us to combine animal-level models of resources needed by the animal with the larger impacts of that resource use, and of how wastes and byproducts are handled. This can be done on a national level, but can also be used to study production in a specific region or market chain, such as my current research analyzing the carbon footprint of sheep production in California.

One of the next big areas to explore with these models is in creating a more holistic assessment of the system being studied, an area where researchers are already making great progress. For example, grass-fed stages of ruminant meat production can contribute significantly to the overall carbon footprint of a product, both because of slower weight gain and because more methane is produced from fiber-rich feeds like native grasses than from higher-starch diets like you would see in a feedlot. However, ruminants provide many benefits to native rangelands, such as grazing invasive species to prevent their spread and reducing plant matter that could become a fire hazard. Many rangelands cannot produce human-edible plants without high quantities of economically and environmentally expensive inputs, which would destroy the native ecosystems. By producing sheep and cattle, the long-term health of these systems is protected while contributing to the overall food supply, promoting agricultural sustainability.

Models are an important part of sustainability research, allowing researchers to combine large amounts of data to predict not only the impacts of current systems, but to allow us to build a better future by identifying which production and management strategies are most likely to be effective. By combining animal-scale models to predict the impact of changes for the average animal in a herd with system-level models to see the large-scale impacts of these changes, producers and regulators can work together to protect the environment while still producing a stable, sustainable food supply.

Picture credit: Dan Macon, Livestock and Natural Resources Advisor, Placer-Nevada Counties

Feral Pigs on Your Property-A Nuisance…and They Carry Disease

by Jennifer McDougle, Animal Health Branch Veterinarian, California Department of Food and Agriculture (CDFA)

Feral and wild pigs carry many diseases that can affect your swine. Among the harmful organisms, two are pseudorabies and brucellosis.

Wildlife Services performs surveillance in targeted feral swine populations. Within California, feral swine have tested positive for pseudorabies and brucellosis in Kern, Monterey, San Luis Obispo and Santa Barbara counties. Santa Barbara area had never previously had a positive pseudorabies case but did in 2016.

The first mentioned disease, pseudorabies, is an extremely contagious herpesvirus that affects pigs and, rarely, several other species. California is officially free of pseudorabies in our commercial swine herds due to the effectiveness of the eradication program. However, the wild pigs in the mountains of southwestern Kern County, eastern San Luis Obispo and Monterey counties (and now Santa Barbara) continue to harbor this virus and continue to be a threat to our healthy pigs. Because our commercial herds are not exposed to pseudorabies, chance exposures to the virus would cause massive piglet and juvenile pig death, with severe upper respiratory disease and abortions in older pigs. These adult pigs may survive, but are carriers of the disease and therefore usually sent to slaughter if positive. It is possible for cattle to be infected with pseudorabies but is very rare. Cattle with pseudorabies show intense itching, neurological signs, and upper respiratory signs. Though rare in cattle, is still best to practice good biosecurity as described below to prevent contact between range cattle and feral/wild swine.

Brucellosis is the other mentioned disease carried by feral/wild swine and this one is contagious to humans. It is a bacterial disease that can be transmitted to cattle and humans as well as being a risk to commercial swine. In cattle and swine, clinical signs of brucellosis include abortions and low fertility rates. Brucellosis in humans can cause a chronic life-long flu-like illness called undulant fever. People most at risk are farmers or veterinarians who are in close contact with infected animals especially during farrowing, lambing and calving.

Feral pigs carrying both of these diseases may appear healthy, and the diseases can easily be transferred through direct nose to nose contact or close proximity as well as being carried on hunter's clothing and footwear.

Infections with pseudorabies or brucellosis would have economic implications, especially where export is concerned. As with any illnesses that are increasing in your herd, contact your veterinarian if any of the above clinical signs are observed

Biosecurity is the best way to keep your herds away from the feral pigs and keep them healthy. If you are in an area where feral pigs have been seen, double fencing to prevent nose to nose contact is recommended. Free access to water and feed will attract feral pigs to your property, so ensure feral pigs cannot access and contaminate these resources. Hunters should be aware that when out in an area where feral pigs may be it is a good idea to change outerwear before interacting with their personal animals. It is not common to diagnose pseudorabies in dogs, but they are also susceptible. Dogs with pseudorabies have neurological signs and die suddenly. Infection in dogs is easily avoided by

not allowing raw pig carcasses/meat to be fed to dogs or other livestock. Below are some helpful links for more information.

Biosecurity Tips (Swine Exhibition):
https://www.cdfa.ca.gov/ahfss/animal_health/pdfs/Biosecurity_TipsFor_Swine.pdf

Swine Health Information Resources:
https://www.cdfa.ca.gov/ahfss/animal_health/Swine_Health.html

The National Pork Board offers information that helps producers formulate a plan to protect their swine herds. Information regarding biosecurity and control is also available on line from the American Association of Swine Veterinarians by accessing their publications link.

- General Prevention Practices for Swine Producers
- General Prevention Practices Checklist for Swine Producers
- General Prevention Practices for Farms
- Wash Your Hands Sign
- Policies for Visitors Contacting Animals or Entering Animal Areas – Sign
- Farm Visitor Policies – Sign
- Biosecurity Recommendations and Guidelines (Entire Document)

Please contact your CDFA Animal Health Branch Office at 559-685-3500 if you have any questions or seek further information about protecting your herds.

Picture credit: Billy Higginbotham, Texas A & M Extension, Wildlife and Fisheries Specialist

UC IPM Wild Pigs Pest Note – Now Available!

While we're on the topic of wild pigs, there is now a pest note available that discusses control of wild pigs in California. Visit the link below or contact Julie for a copy.

http://ipm.ucanr.edu/PMG/PESTNOTES/pn74170.html

Why a Livestock Advisor learned about fig trees
by Rebecca Ozeran

As a livestock and natural resources advisor, I don't expect to get questions about fruit trees such as figs. As it turns out, I recently needed to know just enough about figs to provide information on how to kill them – a Fresno County rancher was curious about how to prevent the trees from continuing to threaten his water infrastructure.

Here's the big question: Why and how are we getting figs on rangelands in Fresno County? And why does it matter?

For starters, Fresno County used to have several thousand acres of cultivated figs (nearly 13,000 ac in 1966[1], but less than 7,500 ac as of 2016[2]), so there are many places in the county where volunteer figs can be seen sprouting, including in newer subdivisions where fig orchards used to be, e.g. the "Fig Garden" region of the city of Fresno. Landowners also may have decided to plant figs on their rural properties as a source of fresh fruit and/or shade, and once established, the figs were able to reproduce and spread. Although fig populations seem to grow slowly in new areas, figs have invaded riparian and other natural areas throughout California's Central Valley[3] – at least as far north as Yolo, Butte, and Tehama Counties – and the trees can be tough to control once established.

Of course, if fig didn't cause any problems where it grew in these natural areas, we wouldn't be talking about it today. Unfortunately, fig is capable of displacing native plants and forming thick clusters of fig where nothing else can grow[3], often in riparian areas. This is problematic for livestock owners, since grazing animals don't find fully grown fig trees appetizing. This can also be bad news for the biodiversity found in riparian areas, as figs become a monoculture. In addition, fig tree clusters decrease ground cover from litter (fallen leaves, grass stems, etc.) which means the fig-dominated areas have more bare soil than grassy or shrubby areas.

Trees also tend to transpire more water than herbaceous plants like grasses, so they can actually take more water from stream systems and cause lower stream water levels[4]. Between the lower water levels and the higher exposed soil, water quality may decline as more soil erodes into the smaller volume of water; the overall concentration of soil particles in the water is much higher than it would have been prior to fig invasion. The murkier, shallower water might pose a threat to the survival of some aquatic animals which require certain water temperature, clarity, or depth. Lastly, there is the threat fig roots pose to water infrastructure (pipelines) as seen by the landowner who contacted me. Figs have a strong root system and can cause damage to belowground infrastructure if it is within their root zone.

All of those consequences should help illustrate why someone might consider fig a weed. When I reached out to the UC Weed Workgroup for advice on this subject, several members provided great information which I will briefly summarize.

Mechanical treatments are impractical, because fig can create new sprouts from cut stumps, stems, and roots. The sprouts would then require a repeat treatment, which is not always feasible. Applying glyphosate (e.g. Roundup) to the leaves is not effective; more effective treatments are cut stump or basal bark applications of various herbicides, including combinations listed in the informative

Weed Control in Natural Areas[5]. Based on the book, very little is known about the efficacy of many herbicide treatments on fig itself, and treatment recommendations are based on their use in other species. Only triclopyr (e.g. Garlon 4) has been tested explicitly on fig. Triclopyr is particularly effective when applied as a basal bark treatment. Alabama's Cooperative Extension Service created a great resource explaining basal bark treatment, and you can download the document here: http://www.aces.edu/timelyinfo/Ag%20Soil/2010/December/Dec_2010.pdf

One member of the workgroup, Dr. Kerri Steenworth of USDA-ARS, referred me to Dr. Katherine Holmes, a restoration ecologist who is currently Assistant Executive Director of Solano County RCD and Chair of Solano County Weed Management Area. Dr. Holmes has investigated riparian and rangeland restoration connected to fig tree invasion in California's Central Valley[3,6,7]. When I spoke with Dr. Holmes, she confirmed that triclopyr basal bark treatments have been the most effective in her experience. She has never attempted stem injection or cut stump application on figs but hypothesizes that the strong sap flow would likely reduce the effectiveness of injected herbicide, and that the root system of cut and treated stumps may still be able to create new stems. Dr. Holmes suggested coating the basal 6 to 8 inches of the fig trunk with a mixture of 75% Hasten (a surfactant) and 25% Garlon 4 (triclopyr), as long as the tree isn't in or near water. Basal bark treatments require that the tree is still alive for long enough time that the herbicide distributes throughout the tree's vascular system, so you may want to wait until the tree is visibly dying before you begin any mechanical removal.

NOTE: Garlon 4 is not labeled for use in areas where it can get into streams or other surface water, and it may contaminate groundwater if the soil has a shallow water table. Alternative triclopyr-based herbicides may be labeled for use in these areas; always read and follow pesticide labels.

Fig trees are an unusual weed issue I didn't realize we had until this question came up. Fortunately, there seems to be an effective solution available. More research on treating this species as a weed could be valuable, since fig production is in decline in Fresno County and fig invasion may continue in natural areas. If you have additional questions about weedy fig control contact Julie.

This is not a specific endorsement of Garlon 4 nor does the omission of other specific trade names reflect the view of the author. Refer to your local chemical dealer or manufacturer for specific herbicide products available.

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Figures:
1. Retrieved from https://ucanr.edu/repository/fileimage.cfm?article=99170&p=HVFBYB
2. (C) David R. Jackson and Penn State Extension. Retrieved from https://extension.psu.edu/using-basal-bark-herbicide-applications-to-control-understory-tree-species.

Ask the Advisor

by Julie Finzel and Brad Hanson

I need to spray some weeds in my pasture…when is it safe to let the animals graze again?

This is a fairly common question as this information isn't always easy to locate on product labels. It's important to follow all label guidelines when applying herbicides or pesticides as it is required by law. The safety of post-spray grazing and recommended 'no-graze' times will vary based on the herbicide used and the type of livestock that will be grazing.

Most frequently, the herbicide being applied is a post-emergent broadleaf herbicide, however, there are instances where a post-emergent, non-selective herbicide might be used, or even a pre-emergent broadleaf herbicide. The guidelines for some of the most commonly used herbicides labeled for pasture use are reviewed below. Most grazing restrictions are related to lactating dairy animals and hay harvesting, however, some herbicides do have grazing restrictions for non-lactating dairy animals. In most cases a trade name is provided in addition to the chemical name of the active ingredient. This is not intended to be a guide for how to control weeds in your pasture, rather this is a resource for grazing restrictions post-herbicide application. If you have questions about weed control in your pasture or you are planning to use an herbicide not listed below and you would like more information, please contact your local UC Cooperative Extension Livestock and Range Advisor.

- **2,4-D.** Most labels indicate a 7 day restriction for dairy animals, a 3 day restriction between grazing treated pasture and slaughter of meat animals, and 7 days between application and harvest of grass hay. No restrictions were listed for other classes of animals.
- **Aminopyralid (Milestone).** No restrictions on grazing or hay harvest, however, cut foliage should not be used as a mulch.
- **Clopyralid (Transline).** No restrictions on grazing or hay harvest, however, cut foliage should not be used as mulch.
- **Dicamba.** Restrictions vary based on application rate and formulation, read the label carefully before applying the herbicide to determine which restrictions apply to your product. Grazing restrictions for lactating dairy animals can be 7-40 days before grazing and 37-70 before hay harvest. No grazing restrictions for non-dairy animals.
- **Fluroxypyr (Vista XRT).** No grazing restrictions for livestock, wait period of 7 days before hay harvest required. There is a 2 day restriction between grazing treated pasture and slaughter of meat animals.

- **Glyphosate (Roundup).** At the rate of 2 qts/acre or less, no waiting period is required for any class of livestock or for hay harvest. Above 2 qts/acre livestock must be removed before application and the waiting period is 8 weeks before grazing or harvesting hay.
- **Triclopyr (Garlon).** Lactating dairy animals should not be grazed until the next season. Slaughter animals – 3 day restriction. Hay harvest requires a 7-14 day restriction depending on the label. No other grazing restrictions.

IMPORTANT: Instructions, grazing and haying restrictions, and application rates vary from product to product. It is critical to follow label directions for your chosen product precisely in order to be within legal requirements and to ensure the safety of people and livestock exposed to treated areas.

Warning on the Use of Chemicals
Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock. Consult the pesticide label to determine active ingredients and signal words.

Pesticides applied in your home and landscape can move and contaminate creeks, lakes, and rivers. Confine chemicals to the property being treated and never allow them to get into drains or creeks. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down sink, toilet, or outside drains. Either use the pesticide according to the label until the container is empty, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

Now Available – Cow/Calf Cost and Return Study for the Southern San Joaquin Valley

Recently published online, calculations for the cost and return study for a cow/calf enterprise in the Southern San Joaquin Valley are based on a 300 head cow herd. Some assumptions made within the study include no hired labor, the average cow remains in the herd for 8 years, the bull to cow ratio is 1 bull for every 30 cows and 105 tons of alfalfa hay are fed annually. Considering these and other assumptions, the annual operating cost per cow is $650.25. The study can be accessed through the link below or contact Julie and she will send you a copy. I encourage all of you to read and analyze the study and tell me what's wrong with it. Hope to hear from you all soon. ☺

Southern San Joaquin Cow/Calf Cost and Returns Study

The University of California has a large selection of cost studies available on most agricultural products produced in California. To find those visit: https://coststudies.ucdavis.edu/en/current/

Look for more cost studies to be published soon including one addressing sheep production and another, on stocker steer enterprises.

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