RANGE BULLETIN

Livestock & Natural Resources Newsletter

In this issue:

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News Briefs

Rangeland Meeting Feb. 24 - Stockton, CA

The University of California Ag and Natural Resources, the California Rangeland Conservation Coalition, and the Range Management Advisory Board present:
Rangelands and Fire:
***Navigating the Proposal Process for Wildfire Fuels Treatment Using Targeted Grazing*, and**
Working Rangelands: Graze to Reduce the Blaze

Read more and register here.

Post-Fire Forest Resilience Workshop

Online weekly from 6:00-7:30pm, from February 1 to March 15, with in-person field trips on March 16 and 17

Participants will use some resources on their own time to complete learning modules and short activities outside of the Zoom meetings. The focus is on recent fires in the central Sierra Nevada. In-person field trips will visit the Creek and Oak fires to see fire impacts, restoration needs and strategies and restoration projects on private and public lands. Registration is $25.

Sign up now at: http://ucanr.edu/post-fireworkshops
For questions, contact Daylin Wade, dwade@ucanr.edu.

How Meatpacker Procurement Policies Impact Producers in the Beef Supply Chain

By Dr. Tina Saitone, UCD extension Ag Economist (January 2023)

This article was originally published as a UC Davis blog post - view here.

Producers and policy makers have shared concerns surrounding the competitive landscape of the beef industry in the U.S. for decades. Along with increased ownership concentration, the beef processing industry has also become more vertically integrated and has expanded its use of contracts (also known as alternative marketing agreements). These industry trends make the market for cattle increasingly thinly traded (i.e., few cash transactions). These thin markets are more susceptible to manipulation and easily impacted by market participates (e.g., meat packers). In late 2016, Tyson Foods, Inc. announced to its suppliers (i.e., beef producers) that it would no longer purchase Holstein cattle at its Joslin, IL harvest facility, one of the largest beef packing facilities in the U.S. This decision provides a unique research opportunity to study how the decision of one processor, making a plant-specific decision, changed the market for dairy-bred cattle across the country.

Beef Processing in the U.S.

In 2018 there were 663 federally inspected plants in the U.S.; the largest thirty-three plants (with capacity over 300,000 head) harvested 86% of total beef cattle. Figure 1 (next page) plots the beef processing facilities registered with establishment size "large" with the Food Safety Inspection Service. The three main companies, owning twenty of these thirty-one "large" plants, are Cargill, Inc. (6), JBS USA Holdings, Inc. (8), and Tyson Foods, Inc. (6). Harvest facility capacity and geographic location are important considerations when analyzing a plant-specific procurement decision given the regional nature of cattle procurement markets. When fed cattle are shipped from the feedlot directly to a harvest facility, the U.S. Department of Agriculture (USDA) reported that they travel an average of 87 miles (APHIS,USDA2013). Feedlots procure cattle from a variety of sources (e.g., local sales, satellite video auctions, individual cow-calf operations). The average distance traveled from shipment source to feedlot location for feeder cattle is 101 miles according to surveys conducted by USDA (APHIS, USDA 2013). Aggregating across these two averages suggests that most cattle remain within a 200-mile area surrounding a given harvest facility.

Model and Results

To evaluate how Tyson's procurement strategy change impacted producers, we used a statistical model that considers the relative levels of prices for Holstein and traditional beef breeds change over time.

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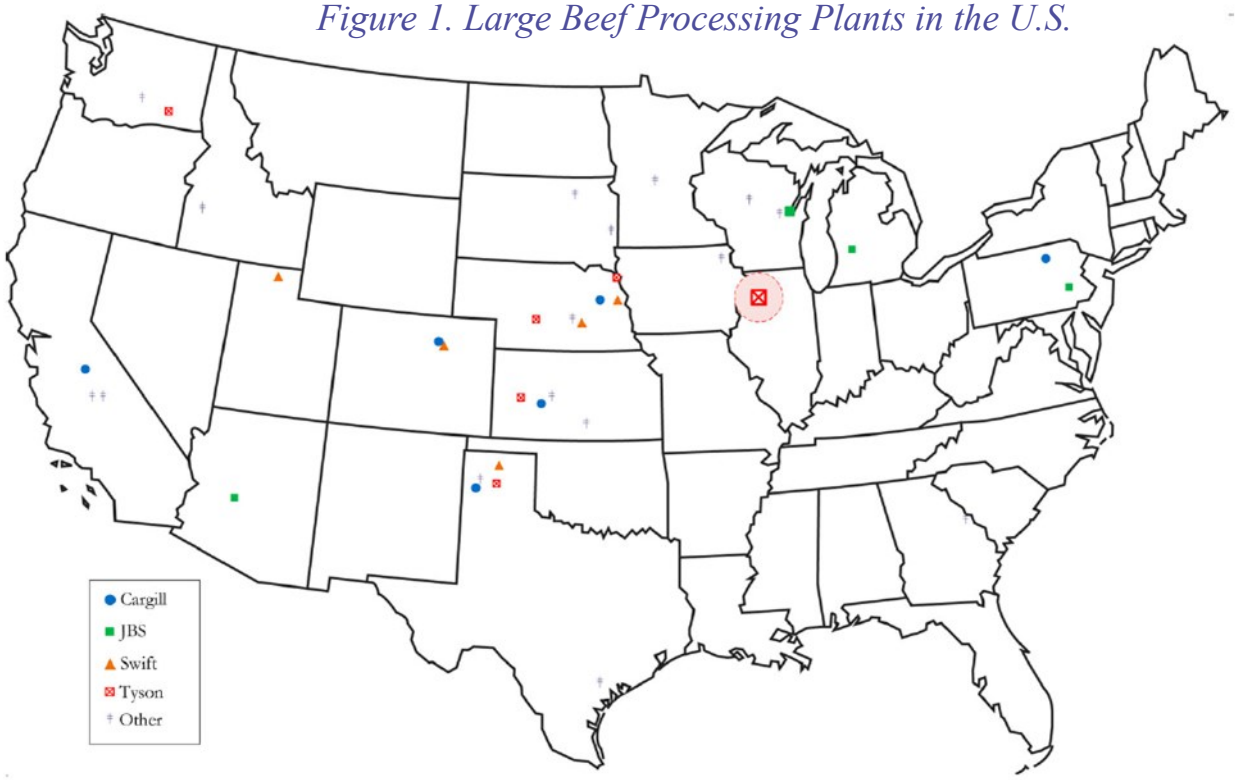
Supply continued

Figure 1. Large Beef Processing Plants in the U.S.



We also look to see if there are changes in this "relative" relationship around the time of the Tyson announcement. Figure 2 (next page) summarizes the estimated impact that the Tyson announcement had on dressed, fed, and feeder Holstein prices and how long those price changes persisted in the market. Prices for fed and dressed Holstein cattle dropped by 5.5% and 3.5%, respectively. This price decrement persisted for at least 150 weeks following the announcement. Holstein feeder cattle prices were harder hit; initially declining by 22% and struggling for nearly 2 years before finding a new equilibrium that was 4.8% below pre-announcement prices.

Aggregate Impacts

Tyson's decision led to an annual revenue loss for fed Holsteins of $77 per head (live-weight) and $47 per head (dressed weight). At the national level, these figures correspond to a $311 million in annual revenue losses on a live-weight basis. In light of the ban on Holsteins at the Joslin facility, finishing margins have fallen by $50 per head, or 6% annually in 2017 and 2018. At the national level, this corresponds to a loss of $205 million annually in gross profits to Holstein finishing operations.

Dressing margins, on the other hand, have risen by $29 per head—or almost 63%—as a result of the decision. At the national level, this corresponds to a $119 million gain in gross profits. A portion of this value accrues to feedlot operations who choose to market their cattle on a dressed, rather than live, basis.

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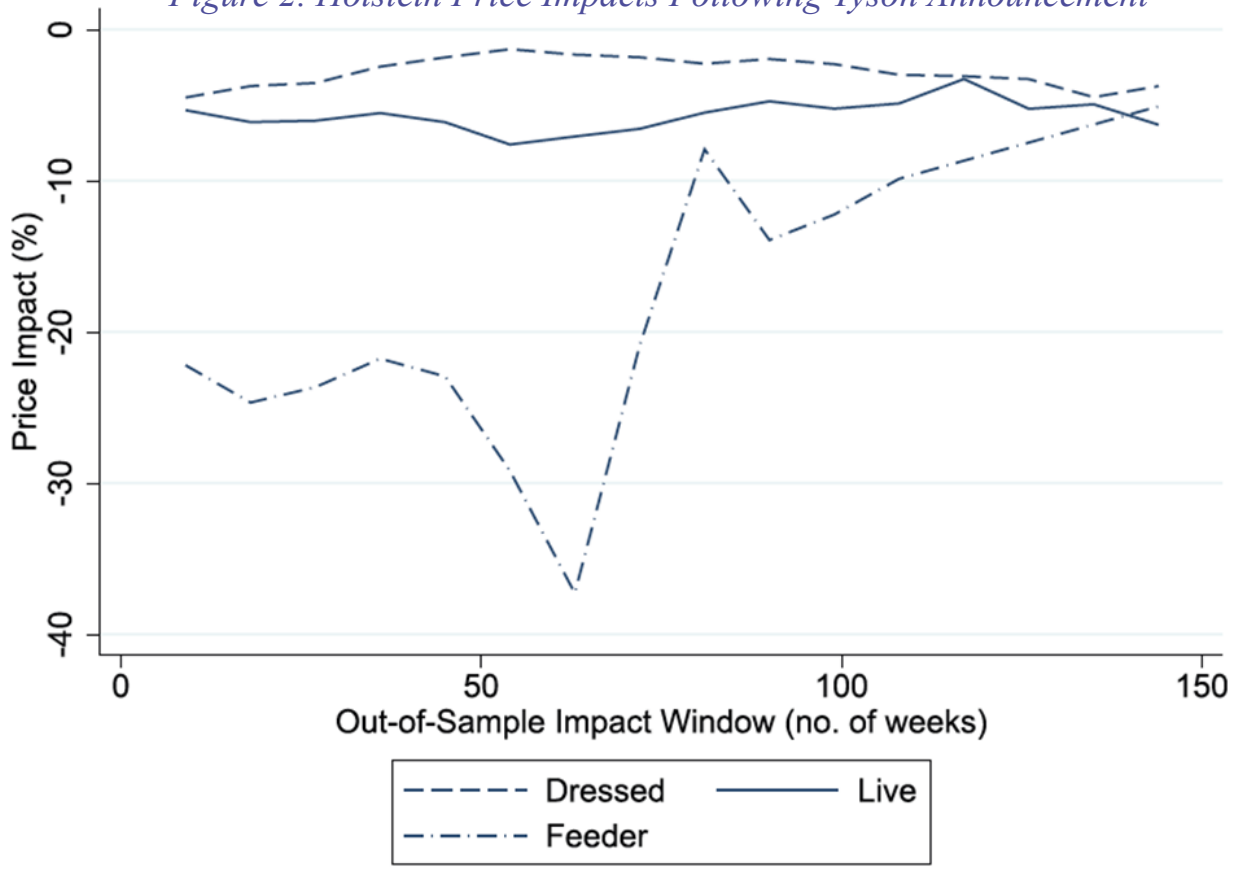
Supply continued

The other portion accrues to packers who continue to purchase Holsteins for beef processing. Ultimately, the estimated impact to U.S. Holstein feeder operations' revenues and gross margins, totaled a $610 million loss annually.

Given the industry's structure and characteristics, regional shocks (e.g., incidents that close plants) and more encompassing incidents (e.g., worker heath issues that close processing plants) are likely to generate large price impacts that will be felt by beef producers.

Figure 2. Holstein Price Impacts Following Tyson Announcement



This blog post is adapted from: M.G.S. McKendree, T.L. Saitone, and K.A. Schaefer. 2020. "Oligopsonistic Input Substitution in a Thin Market," American Journal of Agricultural Economics, 103(4): 1414-1432.

If you have questions about this article, contact Dr. Saitone via tlsaitone@ucdavis.edu

Learning the benefits, challenges of integrated crop livestock systems

By Paulina Binsfeld, UC ANR Crop-Livestock Integration Intern, 2022
Editor's note: This blog post was originally written in November 2022.

This summer, I had the pleasure of working for UC ANR and the Sustainable Agriculture and Research Program (SAREP) for a four-month-long internship to organize two webinars and an in-person symposium on integrated crop livestock systems (ICLS).


Image: Farm visit at Massa Organics with Raquel Krach

Pursuing a master's in organic agriculture, I have some background knowledge on the topic, but even so I learned so much from farmer interviews and researcher panels. I knew that animals could be integrated on cropland to perform some sort of mutually beneficial task, like sheep removing intercrop cover in vineyards or ducks removing snails in orchards. However, the complexity of the system – and of the elements needed for successful implementation – was something that became very apparent to me, as well as the great potential benefits.

Our webinars and symposium were great successes and created educational and networking opportunities for the speakers and guests alike, shedding light on the practical and theoretical aspects of ICLS.

When conducting background research on ICLS to plan the events, I learned a lot about the potential benefits of this system. One allure of ICLS is its potential to contribute to nutrient cycling and soil health, as the inclusion of animals has been proven to benefit both. First, the direct deposition to the soil by way of animal manure provides plant-available nutrients to the system that can quickly and easily be utilized by target crops (Garrett et al., 2017). This manure also adds microbes to the soil, which help with nutrient cycling and creating a more resilient soil ecosystem by encouraging more biodiversity (Attwood et al., 2019).

Another key benefit is soil carbon sequestration, which is achieved by a few mechanisms. Grazing increases the resources that plants allocate to roots, increasing root biomass and thus increasing carbon stored below ground (Brewer and Gaudin, 2020). Grazing also stimulates roots to release sugars made up of carbon from the atmosphere into the surrounding soil, sequestering carbon and feeding microbes (Schuman et al., 2002).

With this background knowledge, I began planning the webinars. I conducted farmer interviews to understand the topics that were relevant and necessary to cover. I decided to make one webinar focused on orchard grazing and the other on contract grazing.

The webinars were very successful and had great turnouts, creating a lot of discussion and networking among farmers, researchers, presenters and guests. I learned a lot from these webinars myself, gaining insight into the farmer's perspective on benefits and challenges of implementing ICLS.

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ICLS continued

I learned that one of the key benefits farmers were experiencing was the replacement of fuel-based machinery with animals and how this saved money, especially given current fuel costs. "There are times when we walk through after the sheep have been there and it almost looks like they mowed it," said Benina Montes of Burroughs Family Farms in Denair, describing how the sheep in her almond orchards can replace machinery.

Image: Panel discussion on grant writing, Sep. 2, 2022

One farmer also noted the key benefit in creating a new flow of income by selling off lambs. Most farmers also agreed there was some undefinable benefit to having the animals out in their fields and that they added to the system simply by being there and making people happy. This leads to benefits from agritourism and public appeal as well, as people on social media and farm visitors particularly enjoy engaging with the animals. A farmer noted how this aided overall appearance, making their farm look more "natural" and signaling their efforts to advance organic regenerative farming.

"People like to see animals on social media; it speaks to the type of farming being done," said Martin Bernal Hafner of Alta Orsa Winery in Hopland.

The webinars also shed light on the challenges of ICLS. Food safety laws for organic systems require animals be off land growing crops 90 days before harvest for crops harvested above the ground and 120 days before harvest for crops harvested on the ground. This presents a major obstacle in keeping animals on the field, as that is a critical time for them to be grazing and removing cover crops or weeds.

As explained by Benina Montes: "The biggest thing is the food safety because historically almonds have been harvested off the ground but even right now (in July) I have vegetation the sheep could be eating." For some farmers, this makes the practice of ICLS not worth it, as they still need to mow at some point within that window.

Therefore, logistical planning is a key challenge facing farmers in implementing ICLS. This also relates to timing of contracted grazing versus having one's own flock or herd. Since these factors were frequently mentioned by farmers during the webinars, we decided to cover them during our symposium by using a serious game to play out the scenarios of grazing crop systems.

Images: Serious game playing

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ICLS continued

This game, called Dynamix and developed by Julie Ryschawy of INRAE (France), was a great success, engaging participants in the topic of logistical planning and fostering cooperation to create successful ICLS systems. The game ran through theoretical scenarios where farmers played specific roles and had to interact with one another to accomplish set goals for ICLS.

The symposium also had a grant writing workshop, fencing demo, farm presentation, and sheep handling presentation. Overall the day was educational and facilitated the networking and information exchange that we had hoped for.

Image: Electric fence demo, Sep. 2, 2022

Together, the outreach effort of the webinars and symposium led to excellent discussions on the topic of ICLS. There are still, however, many questions, as this topic is somewhat unexplored in academic research. First, farmers want to know the actual economic benefits or tradeoffs that come from implementing livestock in cropping systems. As there are many ecological benefits that are hard to quantify, this is difficult to do.

Farmers also want solutions to food safety laws that can be prohibitive in implementing ICLS and want more research done in the sector to identify where the real risks are. Finally, farmers want to know how to best plan the logistics for their ICLS system, whether it be through contract grazing or owning their own animals, and sometimes need help achieving this.

For more information, see:

UCANR, Livestock-Integrated Cropping Systems Webinar series, 2022.
Webinar 1: Integration of Livestock in Orchard Systems and *Webinar 2: Contract Grazing in Orchards and Vineyards* were recorded and can be viewed on YouTube here.

References

Attwood, G. T., et al. "Applications of the soil, plant and rumen microbiomes in pastoral agriculture." Frontiers in Nutrition 6 (2019): 107.

Brewer, K.M. and Gaudin, A.C.M. “Potential of crop-livestock integration to enhance carbon sequestration and agroecosystem functioning in semi-arid croplands. Soil Biology and Biochemistry 149: 107936.

Garrett, R. D., et al. "Social and ecological analysis of commercial integrated crop livestock systems: Current knowledge and remaining uncertainty." Agricultural Systems 155 (2017): 136-146

Schuman, G. E., et al. "Soil carbon dynamics and potential carbon sequestration by rangelands." Environmental pollution 116.3 (2002): 391-396.

EPA proposed changes to rodenticide labels for agricultural use: opportunity for public comment

By Roger A. Baldwin, Professor of Cooperative Extension, UC Davis and Niamh Quinn, Cooperative Extension Advisor, UC South Coast Research and Extension Center

Rodents cause substantial damage and health risks in agricultural productions systems through direct consumption of fruit, nuts, and vegetative material; damage to the plant (e.g., girdling of stems and trunks); by providing a food safety hazard from contamination; damage to irrigation infrastructure; damage to farm equipment; burrow systems posing a hazard to farm laborers; posing a health risk through potential disease transmission; and increased soil erosion by water channeling down burrow systems, among other potential damage outcomes. They also cause substantial damage and food contamination risks in livestock holding facilities, food processing facilities, barns, and other agricultural-related structures. As such, effective management is needed to minimize these risks. The use of rodenticides is often considered the most efficacious and cost-effective tool for managing rodent pests, and as such, it is often included in Integrated Pest Management (IPM) programs designed to mitigate rodent damage and health risks.

Given the significance of rodenticides in managing rodent pests, it is important to know that **the U.S. EPA has recently released a list of Proposed Interim Decisions (PIDs) for public comment that, if approved, will substantially alter if and how rodenticides may be used to manage rodent pests in the near future**. As such, we felt it was important to inform California's agricultural producers as to the extent of these proposed changes, and if you are so inclined, we have provided a link for you to provide public comment on the PIDs, as well as links to contact your Senate and Congressional representatives to ensure your opinion is heard.

All rodenticides are currently under review. These include first-generation anticoagulants (FGARs; chlorophacinone, diphacinone, and warfarin), second-generation anticoagulants (SGARs; brodifacoum, bromadiolone, difethialone, and difenacoum), zinc phosphide, strychnine, bromethalin, and cholecalciferol. Of these, only FGARs, zinc phosphide, and strychnine have labels for use against field rodents (e.g., ground squirrels, pocket gophers, voles, rats, and mice found in agricultural fields), but not all of these active ingredients can be used for all rodent species. As always, it is imperative to fully read a rodenticide's label before determining if it is appropriate for use against a particular species and in a specific situation. That said, the following are some significant changes that have been proposed that you should be aware of. Other potential changes have been proposed as well, so please check out the PIDs for additional details (linked at the end of this document).

1. **All rodenticides for field applications will become restricted-use products.** This means that applicators will need to be certified to use restricted-use products in these settings. They will also have increased reporting requirements for their use.
2. **Aboveground applications would be eliminated in rangeland, pastureland, and fallow land.** This is a substantial deviation, as many/most applications in these areas have traditionally been through broadcast applications or spot treatments. This change would leave only bait stations for ground squirrels and voles.

This article continues ▶

Rodenticide continued

3. **Within-burrow applications of FGARs will generally not be allowed in croplands during the growing season.** This would eliminate FGAR application for pocket gophers for much of the year, and would eliminate it for all uses in some crops (e.g., citrus and alfalfa in certain areas of the state).
4. **Carcass searches will be required every day or every two days** (starting 3-4 days after the initial application), depending on the product used and where applied, for at least two weeks after the last application of the rodenticide. When carcasses are found, they must be disposed of properly. Any non-target mortalities must be reported to the U.S. EPA. Collectively, this will require a major increase in labor, potentially making rodenticide applications impractical in many settings.
5. **Extensive endangered species designations are anticipated that will limit or eliminate the potential to apply rodenticides.** This could have broad impact, but the full extent is not currently known.
6. New labels will require the use of a PF10 respirator and chemical resistant gloves during application. This is a substantial change for some rodenticide labels, requiring fit testing for all applicators, with the requirement of respirators ultimately making rodenticide application more physically challenging.

Additional details on these proposed changes can be found at the following websites:

1. Anticoagulant PID: https://www.regulations.gov/document/EPA-HQ-OPP-2015-0778-0094
2. Zinc phosphide PID: https://www.regulations.gov/document/EPA-HQ-OPP-2016-0140-0031
3. Strychnine PID: https://www.regulations.gov/document/EPA-HQ-OPP-2015-0754-0025
4. Bromethalin and cholecalciferol PID: https://www.regulations.gov/document/EPA-HQ-OPP-2016-0077-0024

As mentioned previously, these proposed changes are likely to have a substantial impact on the use of rodenticides in agricultural settings. However, these changes are currently open for public comment. If you would like to comment on these proposed changes, the required links and useful guidance can be found at the following website: https://responsiblerodenticides.org/.

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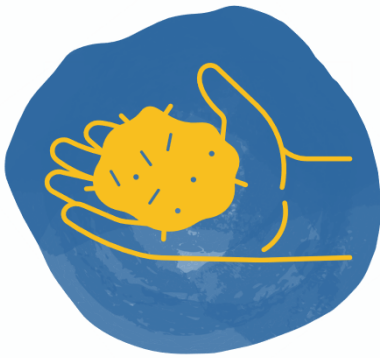
Rodenticide continued

ABOVEGROUND APPLICATIONS ELIMINATED

In cropped areas, rangeland, pastureland, and fallow land, this change would leave only bait stations for ground squirrels and voles

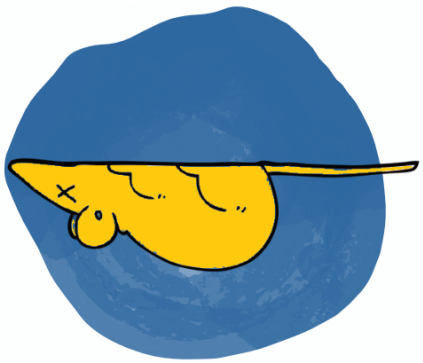


RESTRICTIONS ON WITHIN BURROW APPLICATIONS OF FGARS

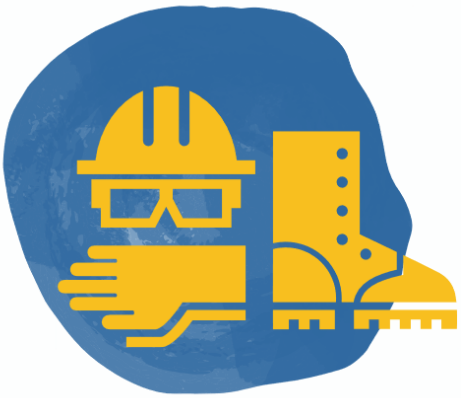
This would eliminate FGAR applications for pocket gophers for much of the year, and would eliminate it for some crops (e.g., citrus and alfalfa in certain areas of the state)

CARCASS SEARCHES

Carcass searches will be required every one to two days for at least two weeks after first application



Rodenticide continued



PPE

Proposed changes will require a APF-10 respirator that will require fit testing for all applicators of these products

ENDANGERED SPECIES

Endangered species restrictions will limit applications to bait stations within these species' ranges

You may also comment on these proposed changes to your Senate and Congressional representatives. If you are unsure who they are or how to contact them, check out: https://www.congress.gov/contact-us.

There is limited time for making comments to the U.S. EPA, with a final deadline of February 13, 2023. Therefore, you will need to provide your comments in short order.
