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Prescribed Fire Webinar Series Now Available!

For many years now, fire has been considered a land management tool that is no longer accessible. Thanks to Jeff Stackhouse and Lenya Quinn-Davidson, UCCE Advisors from Humboldt county communities across California are starting to talk about fire and use fire on the landscape again. Fadzayi Mashiri, an Advisor from Merced and Mariposa Counties, and others put together a series of five webinars that cover the basics of what you need to know if you are interested in using fire. Those webinars are available on the UCCE Mariposa YouTube Channel or here:

https://www.youtube.com/playlist?list=PL0gGilqcL6_Ejnaj9nKM0D14S0E3lSimx

- Session 1 – Fire Ecology
- Session 2 – Permitting
- Session 3 – Planning
- Session 4 – Resources for Burning
- Session 5 – Cultural Burning

Should I Still Vaccinate For Brucellosis?

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Every state decides on the requirement for brucellosis vaccination in cattle. In California, assembly bill 1801 repealed the mandatory calfhooed vaccination for intact female beef breeds 12 months of age or older and sold within the state as of January 1, 2020. In other words, it is not a requirement anymore that beef breed heifers or cows show evidence of Bangs vaccination before they can be sold within this state. To be clear, there was no requirement to vaccinate beef breed heifers before this law was passed in California if they didn't change ownership. For dairy breed heifers, the story is quite different. They still need to be Bangs vaccinated if they are moved within the state as young as 4 months of age, with some exceptions, e.g. if they are sold directly to slaughter or an approved feedlot.

The new freedom raises the question: should I continue vaccinating my heifers for brucellosis? Let's first take a step back and talk about what brucellosis is: brucellosis is a serious and contagious livestock disease that causes late-term abortions in cattle. The causative agent in cattle is *Brucella abortus*. The disease poses a significant public health risk because it can be transmitted to people. Drinking raw milk or eating soft cheese made from raw milk from infected animals is a common risk factor to contract the disease. Exposure to tissues and fluids from cattle aborting due to brucellosis is another way that farm

workers can catch brucellosis. In humans, the disease is also known as undulant fever because of its ability to cause intermittent bouts of fever. Other symptoms include joint and muscle pain, gastrointestinal symptoms, and orchitis (inflammation of the testes) in men. Brucellosis in people often results in chronic disease lasting months or years. No wonder there was a huge effort in eradicating this disease from cattle in the United States. Through a combination of vaccination, testing and quarantine, removal of positive animals and continued surveillance, we have reached a state where the entire United States has been officially declared brucellosis free. The last infected herd in California was found in 1997 and there hasn't been a case here in cattle since. The only pocket where brucellosis is still around in the US is the Greater Yellowstone Area in the Montana/Wyoming/Idaho region, where brucellosis still lingers in wildlife such as elk and bison and occasionally spills over into a cattle herd. Regulations around vaccination and testing of cattle in the Designated Surveillance Area of that region are strict, e.g. a negative blood test is required for movement or change of ownership for all breeding cattle with few exceptions.

Here in California, far away from any possible brucellosis cases, why one should still vaccinate for a disease we don't have seems to be a legitimate question. Here are some thoughts on what the advantages and disadvantages may be:

Benefits of continued vaccination:

- The vaccine RB51 we use for brucellosis must be administered by an accredited veterinarian. This annual vet visit could serve to go over other vaccination or treatment protocols, renew prescriptions or talk about anything else cattle health related. Remember that your vet needs to document a valid veterinary client patient relationship to be able to write prescriptions and being familiar with the operation and the animals is part of this requirement.
- Brucellosis vaccination comes with automatic official ID, the orange Bangs tag that is applied at vaccination. Official ID is required for interstate movement under certain conditions. We don't know what the future of the metal orange tag is with increasing efforts to implement all official ID to be electronic, but the requirement for official ID for brucellosis vaccinated cattle will likely stay.
- Having official ID helps animal health officials trace animals back to their origin that may be found at slaughter to have a foreign animal disease or a disease that is regulated by USDA or state agencies, such as tuberculosis or brucellosis. Having the capability of tracing the animal back to its origin is the best way of minimizing the spread of the disease to other animals or people, if it is a zoonotic disease.
- If you plan on selling cattle to a state that still requires Bangs vaccination for entry of breeding female cattle, you need to accomplish vaccination before the heifers are 12 months old. At the moment, California does not allow mature vaccination, which is routine vaccination of females over 12 months of age.
- If everyone stopped vaccinating, we would end up with a naïve population of cattle and a new introduction of the disease could cause critical damage. However, the risk of introduction of brucellosis through an animal from the Greater Yellowstone Area into California is very small according to a risk analysis model.

- The California Cattlemen’s Association strongly encourages all California ranchers to vaccinate beef heifers that will be added to the breeding herd to keep them protected from the disease.

On the other hand, you could consider the drawbacks:

- There is some cost and stress to the animals involved in having your vet vaccinate heifers.
- If a heifer is pregnant at the time of vaccination, she may abort and potentially spread the disease to herd mates or people getting in contact with the aborted fetus and placenta. Obviously, heifers should not be pregnant when they are vaccinated for brucellosis, which is why we have the age restriction of 12 months at time of vaccination. In some small studies, where pregnant heifers were vaccinated to test the safety of the vaccine, no abortions were seen. However, because RB51 is a live vaccine, it is a concern.

At the end of the day, you will need to have a conversation with your veterinarian to decide on what is the best decision for your herd in your situation when it comes to brucellosis vaccination.

Summertime - Blue-green algae time

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Blue-green algae, also known as cyanobacteria, can be found in surface water like ponds. These photosynthetic bacteria do not necessarily pose a threat and are actually part of the ecosystem that provides oxygen to other micro-organisms. Under certain conditions, though, a so-called algal bloom may lead to a dramatic increase in their numbers and their subsequent die-off releases toxins into the

water. Warm weather, stagnant water, and nitrogen or phosphorus fertilizer runoff are risk factors that can result in these algal blooms. Some slow flowing creeks and rivers can also be impacted – every year the Klamath Rivers seems affected and Clear Lake is known to have had problems as well. Mild winds can push and concentrate blue-green algae on the water's edge. You will see scum, foam, or a mat of algae, or they can look like paint floating on the water surface. Their color can vary between blue, bright green, brown or reddish.

Blue-green algae produce two types of toxins, neurotoxins and hepato-toxins (liver toxins). Both types can lead to sudden death in cattle if they drink water from ponds where blue-green algae were blooming. Dogs playing in or drinking from ponds and other animals have also been affected. Exposed cattle can have bloody diarrhea, be weak or seem confused. Often the only sign is sudden death. Those animals surviving hepatotoxic toxin exposure can develop what is called photosensitization caused by liver damage, a term for describing that their skin is more sensitive to light, where the skin, especially the lighter areas like muzzle, teats, or vulva peels off. Blue-green algae toxicity is in any case a severe problem and ranchers should be on the lookout to avoid their cattle becoming exposed.

When you are suspecting a blue-green algae bloom, the best way to avoid problems is to prevent access to the water source by fencing off the pond and providing a different water source. Toxin levels will increase as the cyanobacteria die. Once the water has cleared up, the best way to assure the water is safe again is to test at the lab. Toxins likely distribute evenly throughout the water so pumping water from the bottom of the pond may not be safe. However, this can be a good method of prevention. Cattle standing in small ponds depositing nutrients can exacerbate conditions and lead to algal blooms. Smaller water bodies are more vulnerable, because a larger volume of water helps dilute the nutrient load, but large lakes and reservoirs are not immune and have been impacted as well. Diverting water from a pond to a water trough and then fencing off the pond can decrease the nutrient load and help prevent algal blooms. The [Natural Resources Conservation Service](#) (NRCS) can help cost share with this and other livestock water development projects.

If you are in doubt whether you have blue-green algae in your pond, there are a few simple tests to distinguish them from normal harmless water plants or other types of algae. Wear gloves for all these tests to avoid contact with toxins. Thrust a stick onto a mat of algae and pick it back up – if it comes back looking like it has been dipped in paint, it is blue-green algae. If it comes back with threadlike algae dangling from it, it is a different type of harmless algae. Another way to check for blue-green algae is to fill a mason jar or other clear container about $\frac{3}{4}$ with water and refrigerate overnight in a secondary container like a clear plastic bag to avoid any contact between the jar and other surfaces. Carefully inspect the next day; if all the algae are at the bottom, they are likely not blue-green algae. If they are floating at the surface, they are likely blue-green algae. These tests are not 100 % accurate but can be helpful in assessing the situation. If you identify blue-green algae in your pond, that does not necessarily mean that they pose a threat at that time. It does mean, however, that you should watch for algal blooms where toxins are released.

Testing at CAHFS lab is also possible. The lab offers an algae toxin panel, which is priced at \$605 to test for 4 different toxins (Anatoxin-A, Cylindrospermopsin, Microcystins, Saxitoxins) or \$165 for individual toxins. Testing requires 500 ml (about 1 $\frac{1}{2}$ pints) of water that should be shipped on ice to the lab.

If one or more animals die acutely, it is important to consider a postmortem examination to try to determine if an algal toxin is the cause of death. The liver damage associated with exposure to hepatotoxic blue-green algae is dramatic and this can indicate the need to test for microcystins in water or gastro-intestinal content samples. The neurotoxic blue-green algae toxin does not cause any changes in organs after death, but gut contents can again be tested to help determine a cause of death.

Copper sulfate is a way to treat the water and kill the algae but can lead to high copper levels in the water, which can be harmful to cattle. Sheep are particularly susceptible to copper toxicity. Any treated drinking source should be tested for copper levels prior to allowing sheep to consume the water after a copper sulfate treatment. It is important to follow label directions to ensure enough product is used to be effective, but not an excessive amount that can cause toxicity to animals. Bleach can also be a successful treatment. If a pond is treated it will be necessary to determine the volume of the pond, so the proper amount of product is applied. UC ANR publication [8681](#) demonstrates a method for measuring pond volume. In addition, rapid die-off of algae can lead to large amounts of toxins being released into the water making it unsafe even though it appears clear. For this reason, and to ensure ample time for the product to work, livestock should be excluded from the treated water source until the treatment period is over.

More sophisticated technical solutions are available but come with a price tag. Devices that emit ultrasound waves prohibit microscopic algae from floating to the water surface where algae need to spend time for photosynthesis, which is the plants' way of turning sunlight into energy. Blue-green algae will not survive without that energy source. Full systems adapt the emitted ultrasound frequencies according to an algorithm and monitor water quality in real-time alerting the user to any changes in algae levels. The advantages of this system are that the algal cells are not lysed and do not release their toxins into the water and no chemicals must be used that could be potentially harmful to non-target species. A ballpark figure is about \$1,200 / surface acre for larger water bodies. Smaller, less sophisticated units are also available. The disadvantage of this system is that it is less effective in shallow water below 3-4 feet.

Mechanical aeration and mixing are other ways to decrease blue-green algae but require an electrical power source and systems maintenance. Mixing is more effective for deeper water bodies (> 45 ft).

Another thing to keep in mind is that cyanobacteria have been around for billions of years and know a thing or two about evolution. They can adapt to their environment, so whatever you do to control them it's important to stay a step ahead of them and not rely on the same method over time.

The Roundup

Livestock and Range
Newsletter
Kern, Tulare, and Kings

University of California
Agriculture and Natural Resources

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