

LIVESTOCK & RANGE NEWS

SERVING VENTURA AND SANTA BARBARA COUNTIES

Grazing for fire fuels management

Catastrophic wildfires are becoming more frequent, more intense, and more destructive. Fifteen of the Top 20 largest fires in California history have occurred in the last twenty years, while four of the Top 5 largest fires have occurred in the last seven fire seasons (Mendocino Complex—2018; Thomas—2017; Rush, Lassen County—2012; Rim, Tuolumne County—2013). These fires are burning in a variety of vegetation types—from high-elevation northern-Californian coniferous forests to southern-Californian chaparral ecosystems—and some (e.g. the Thomas (2017) and Tubbs, Sonoma County (2017)) have been fanned by unusually strong wind events. Despite these differences, however, there is broad consensus that a major part of the uptick in catastrophic fires is the state’s failure to adequately manage fuel loading in range- and forested-lands.

The state is currently in the process of finalizing a document, the California Vegetation Treatment Program (VTP), which will serve as an update to their 1980s document, “Vegetation Management Program.” This unwieldy document serves as the blueprint for how the state—through the California Department of Forestry and Fire Protection, or CalFire—will strategically approach fuels management. Practices such as mechanical treatments (e.g. mowing, mastication), manual (e.g. weed-whacking, weed-pulling), herbicide application, and prescribed fire will be included in the VTP, as they were in the 1980’s VMP. One remarkable new addition, however, will be the inclusion of grazing as an approved fuels management treatment. Accordingly, there is renewed effort around the state from the livestock and ranching communities to communicate how domestic livestock can be integrated into a responsible, long-term fuels management program.

Fundamentally, we need to think about two kinds of grazing: 1) what might be called, “**traditional**” grazing and 2) what might alternatively be named **targeted grazing** (although it goes by others: prescribed grazing, prescribed herbivory, contract grazing, etc.). Traditional grazing is how we have always thought about grazing: in California, mostly cattle (although sheep, goats, equines, and other ruminants should be included as well) are managed in extensive rangeland pastures (although they can sometimes be managed intensively with electric fences or herding) to produce meat, milk, and/or fiber. In this manner, traditional ranching practice is not dissimilar from how early Californians raised and managed livestock two hundred years ago. Targeted grazing, on the other hand, is different because it is defined by its objective. The ultimate purpose of targeted grazing is to have a particular species of livestock graze at a certain density for a specific period of time for the purpose of managing vegetation. In this model, the salable product is not meat, milk, or fiber but instead acres of biomass cleared, thinned, or removed.

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Figure 1. Goats grazing brush with livestock guardian dog (from Nader et al., 2007)

Importantly, however, it should be noted that both kinds of grazing can and do manage fuel loading in range- and forested lands in California. This is a point the ranching community has worked hard to make in the popular press recently—that grazing in and around urban and suburban areas is a critical tool to mitigate the impacts of wildfire statewide. See, for example, the recent video produced by the National Cattlemen’s Beef Association featuring cow-calf producer Richard Atmore of Ventura, California discuss how grazing on his ranch just outside the city limits reduced impacts to urban residents from the Thomas Fire (<https://www.facebook.com/watch/?v=2365669617085882>). My own experiences conducting soil and rangeland monitoring after the Thomas Fire confirm the same phenomenon. All of the five ranches I sampled had areas of *grazed* grassland that did not burn at all during the fire, immediately next to shrubland areas that burned at high intensity [see Figure 2]. In this way, it is critical to recognize the good work that traditional grazing already does to reduce the sorts of fuels that might otherwise exacerbate fire in wildlands or on the wildland-urban interface.

Furthermore, as a state we should consider how traditional grazing might be expanded to further reduce fuel loading. As one example, we might encourage again grazing in our National Forests, which have seen a precipitous decline in stocking rates over the last sixty years. Fully half of the one hundred allotments in the Los Padres National Forest in southern California, for example, representing ~400,000 acres, remain empty (largely due to the bureaucratic hurdles of complying with NEPA—the National Environmental Policy Act; as an aside, if Congress and the US Forest Service could figure out how to streamline NEPA’s environmental review process in a way that would still comply with the spirit of the Act, hundreds of allotment permits could be re-issued and hundreds of thousands of acres could again be treated with regular cattle, sheep, and goat grazing, which would substantially improve the state’s fuel loading).



Figure 2. Ranch outside of Ojai Valley that burned during the Thomas Fire, December 2017. Note areas of grazed grassland that remained unburned and areas of shrubland that burned at high intensity.

But again, targeted grazing is different. It is an old idea (livestock grazing) applied in a novel manner. Increasingly, homeowners, private land owners, municipalities, public agencies, and utility companies across the state are using grazing animals where it’s too steep to mow, too labor-intensive to hand-pull weeds or run a masticator, too challenging to execute a prescribed burn, or too expensive to apply herbicides. And increasingly, livestock operators are recognizing the nearly limitless business opportunities to manage animals—not for a calf- or lamb-crops—but to get paid to remove vegetation. The market for targeted grazing is still being established, as landowners recognize the value of using grazing animals and as targeted grazing operators work to understand the actual costs of running a targeted grazing business. As such, the cost for the service can vary tremendously and is based on: 1) the size of the project (in acres); 2) the length of the project; 3) how many animals are required; 4) project logistics (proximity to urban areas, ease of ingress and egress, and other potential complications); and 5) how the project is billed (per head vs. per acre). On small projects near urban areas with tight timelines, however, it is not uncommon for targeted grazing services to cost upwards of \$1000/acre; however, many projects may cost substantially less.

It remains to be seen how effective targeted grazing with cows, sheep, and goats will be in Ventura and Santa Barbara Counties. While there is ample evidence that these livestock species will consume the naturalized annual grass species common in the counties, there is less direct evidence of their ability to consume shrub and sub-shrub species common to the chaparral and coastal sage scrub communities we find here. One useful publication from 2007 (Nader et al.) describes results from a 1987 study examining the effectiveness of goat grazing in San Diego

County chaparral in July. They summarize, “The goats utilized 95% of the leaves and small twigs to 0.063 inches diameter from all the mountain mahogany plants. Use of scrub oak was 80%, whereas use of chamise, Eastwood manzanita, and California buckwheat was low, and Ceanothus was only taken under duress. Under ‘holding pen’ conditions, use of less palatable species approached the use of palatable plants.” Certainly, more work and experimentation will need to be done if and when targeted grazing for fuel load modification becomes more widespread in the region. Animal genetics (insofar as it may impact an individual animal’s preference for certain plant species) and augmenting the season of use (e.g. March—during the growing season—as opposed to July) may both be important factors that will influence success. Nader et al. conclude, “[g]razing is best used when addressing vegetation with stems of smaller diameters that make up the 1- and 10-hour fuels. These two fuel classes are important because they can greatly impact the rate of spread of a fire, as well as flame height.” As a result, targeted grazing might be *most* effective 1) in the years after a wildfire, when large diameter shrubs have been removed and begin to regrow; 2) as a follow-up to maintain other fuel treatments, like mastication; or 3) as a way to thin fuels—not necessarily to remove them entirely—to reduce fire intensity and rate of spread.

It is important to recognize that targeted grazing is not exactly like running a traditional ranching operation, and targeted grazing operators face a unique set of challenges. They must be mobile (with their fencing, stock water, handling equipment, etc.), they must provide protection from livestock predators (if running sheep or goats), they must know how to effectively communicate with landowning clients and the general public, and they need to be certain they can provide forage for their livestock year-round (even if the paying jobs are seasonal). As new operators that may or may not have previous livestock experience increasingly offer their services, it will be important to provide resources to ensure their success.

Towards this end, there are efforts statewide and nationally to help support beginning targeted grazing businesses. UC Cooperative Extension colleagues and I are awaiting confirmation this month on a grant that would sponsor a series of targeted grazing workshops, intended to support both landowners interested in targeted grazing and operators interested in getting in the business. Additionally, my colleague in Sonoma County, Stephanie Larson, and others are compiling “matching” systems, that may help landowners find targeted grazing businesses. And finally, the Society for Range Management—the national professional society devoted to the study of range science—alongside other organizations, is considering a certification process for individual operations that would certify professionalism and aptitude.

California’s decision to formally recognize grazing as an important fuels management practice in their forthcoming Vegetation Treatment Program should have a profound effect on the frequency and scale of use of both traditional and targeted grazing. It is an exciting opportunity for the livestock industry to meaningfully help address and provide solutions for the wildfire threat in California.

Further reading

Nader, G., Henkin, Z., Smith, E., Ingram, R., & Narvaez, N. (2007). Planned Herbivory in the Management of Wildfire Fuels: Grazing is most effective at treating smaller diameter live fuels that can greatly impact the rate of spread of a fire along with the flame height. *Rangelands*, 18-24.

Research update: expanding the tools of range improvement...seeding and Yeoman’s plow

As prime rangeland for livestock grazing in Ventura and Santa Barbara Counties continues to be converted to other uses (orchards, houses, vineyards, cannabis, etc.), it is becoming increasingly important to improve the acres that are still available. Towards this end, my colleague—Royce Larsen—and I are putting new effort into an old idea: range improvement.

We are currently working on two research projects that should have important implications for ranchers. The first is a series of seeding trials. Royce spent part of 2018 and 2019 on sabbatical in Logan, Utah, at Utah State University, where he worked with plant breeders at the Agricultural Research Service (ARS) Plant Materials Lab run by the



“Immigrant” variety of forage kochia, developed at the Plant Materials Lab in Utah.



Detail of Yeoman's plow from UCCE workshop in December 2015 in San Luis Obispo. Shanks are long, thin and when operated have limited soil disturbance.

USDA. This relationship is allowing us to trial some new forage species that were initially developed in Utah, to determine their vigor and potential usefulness on the Central Coast of California. We are most excited about “forage kochia” (*Kochia prostrata*), which has been shown to increase forage nutritional value, carrying capacity, and livestock performance on rangelands throughout the semiarid West. It is a sub-shrub—not a grass—that is quite palatable to cattle. Furthermore, because of its later-season growing habit, it serves as an excellent buffer from wildfires because it stays greener longer through fire season. Royce and I have three trial location in San Luis Obispo and Ventura Counties, and our plan is to monitor germination, establishment, biomass production, and palatability to livestock. We should have more to report Spring 2020.

The second project will be examining the use of a tool—the Yeoman's plow—in order to increase water holding capacity in the winter and spring on rangelands, and thus forage production by the end of the peak growing season. The basic idea of the plow is to run long, thin shanks on contour in pastures on the ranch where tractors can be operated. The plow has limited soil disturbance but instead slices through, lifts, and aerates the soil. Our research will focus on how successful the Yeoman's plow is in increasing water holding capacity in the spring and how much of a boost this will have on forage production and species composition. We are working to set up the first Yeoman's plow trial for this fall in Santa Barbara County. See this 18-minute video for a more complete introduction to the concepts of the plow: <https://pitchstonewaters.com/keyline-101-video/>

Royce and I will be hosting a half-day workshop in San Luis Obispo in September highlighting both of these range improvement methods. The ARS researchers from Utah who developed forage kochia will be out here and will discuss their work developing the species. Please see flyer below for more information.

Fly impacts and control on cattle

by Josh Dany, UCCE Livestock and Natural Resource advisor; Larry Forero, UCCE Livestock and Natural Resource Advisor; Gaby Maier, UC Extension Veterinarian Specialist; and Alec Gerry, UCCE Specialist in Entomology

Fly season during the summer months is more than just an annoyance to cattle. The three main culprits are horn flies, stable flies, and face flies, and each of these flies can impact your bottom line. Both horn flies and stable flies feed on cattle blood with bites being quite painful to animals. Horn flies bite and feed on the back of cattle, moving to feed on the belly when daytime temperature is high. Between blood meals, horn flies remain on cattle leaving the animal only to lay eggs in fresh fecal pats. Stable flies bite the legs and sometimes belly of cattle, leaving the animal after feeding to digest the blood meal while resting in the nearby environment. While face flies don't feed on cattle blood, they do feed on eye and nasal secretions and are known to spread *Moraxella bovis* (bacteria causing bovine

pink eye or infectious bovine keratoconjunctivitis), irritate open wounds, and cause tearing of the eye. Like stable flies, face flies leave their animal host after feeding and may be found resting on nearby structures or trees.

Economic Impact of Horn Flies: UC research in 1968 found cattle with horn flies spent more time in the shade fighting flies rather than grazing. To determine how much effect this had on weight gain, groups of cow/calf pairs were split into treatments of fly control and no fly control. The calves receiving fly control gained an average of ½ lb/day more than those receiving none (Loomis et al., 1969). Another trial suggested that each 100 horn flies per cow can decrease the calf's weaning weight by 17.9 lbs (Steelman et al., 1991). Similar yearling steer and heifer gain reductions have also been documented (DeRouen et al., 2003). In neither calves nor yearling cattle have compensatory gains been the norm, meaning these weight gain losses seem to follow fly infested cattle through their production life (Quiesenberry and Strohbehn, 1984). It is notable that in some areas, and in some cases with the Brahma breed, it has been found that some cattle are unaffected by fly levels, but in general, heavy fly infestations significantly decrease production. How do horn flies cause cattle to gain less weight? Their painful bites elevate cattle cortisol levels, lessen cattle ability to retain nitrogen, and reduce water consumption, grazing and mastication efficiency (Harvey and Launchbaugh, 1982; Byford et al., 1992).



Kentucky Pest News

Economic Impact of Stable Flies: The bites of this fly are particularly painful – you may know this if you have been bitten by these flies which many ranchers simply call “biting flies” because they will bite people in addition to cattle. Like horn flies, the painful biting activity of stable flies is known to reduce cattle weight gains and feed efficiency (e.g. Campbell et al. 2001) resulting in economic costs to livestock producers estimated at nearly \$1 Billion (Taylor and Berkebile 2006). Stable flies are most abundant in spring and early summer (Mullens and Meyer 1987) and during years with greater rainfall during early spring (Mullens and Peterson 2005).

Economic Impact of Face Flies: These flies feed on secretions/excretions around the nose, mouth, and eyes of cattle. While they do not deliver painful bites, their mouthparts are adapted for scraping and this can greatly irritate the eyes of cattle on which they feed resulting in increasing eye secretions and tearing. In addition, these flies are known to transfer bovine pinkeye and eyeworms among cattle within a herd as they move among nearby animals during feeding. Pinkeye can result in a decrease in weight gain estimated between 15 and 30 lbs in affected calves at weaning (Thrift and Overfield 1974).

Given the production losses from heavy fly infestations, control of all three flies is economically warranted.

Control of Horn Flies: Fly ear tags, dust bugs and oil rubbers, and pour on applications are the most common insecticidal methods of dealing with flies, but how well do they work? In the UC trial mentioned above dust bags were very effective in controlling horn flies when placed in the entrance to water, which forced cattle through them. Multiple other trials found similar results. In most trials where cattle were given free choice to dust bags, as compared to being forced to walk under them, reductions in efficacy were seen. Pour on insecticides can also be effective in reducing horn flies. Research varies on how long they are effective, but most trials seem to fall between two and four weeks' time. Feed-through insect growth regulators (IGR) that are commonly used in mineral

supplements have demonstrated effectiveness since the 1970s. Horn flies develop only in fresh cattle manure, so insecticides that pass through the digestive system of cattle and are present in the feces can kill developing immature flies. Early research has shown these products can control 87% of horn fly development in the field (Harris et al., 1974).

Ear tags have been in use since the 1980s and have been very effective for horn fly control. (Williams et al., 1981). However, in recent years horn flies have become resistant to several of the insecticides used in ear tags. Resistance from not following label instructions on when to remove ear tags,

using only a single ear tag on cows, or not rotating ear tags with different active ingredients are all possible causes. When control failures occur, ear tags containing a different insecticide should be used.

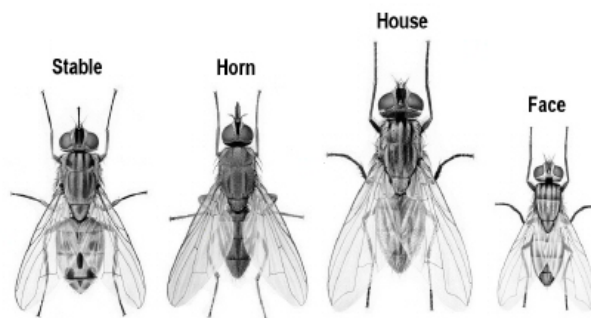
A trial that compared differing pasture sizes, rotational stocking rates, and continuous stocking found no difference in horn fly numbers associated with these factors (Steelman et al., 2003). It appears the flies are present regardless of grazing management and some form of control is necessary to lessen production losses.

Control of Stable Flies: The most effective way to reduce stable flies is to reduce their development sites near cattle. Stable flies will develop in wet, decaying organic material with urine soaked hay being a particularly productive material. Where cattle are fed hay to supplement pasture forage, the position of feeding stations should be altered regularly to reduce the build-up of soiled hay on the ground in these locations. Piled manure or silage will also produce stable flies unless this material is properly composting (including regular turning of the pile). Adult stable flies are challenging to control. Insecticides can be applied directly to cattle (apply insecticides to the legs and belly) or to cloth targets placed near feeding and watering locations where cattle congregate (Foil and Younger 2006) so that flies will rest on the treated targets between blood meals. Similarly, stable fly traps (e.g. “Bite Free”, Central Life Sciences) can be placed at cattle congregation sites to capture stable flies resting between blood meals. Ear tags will not provide control of stable flies. Another option to control stable flies and house flies is the release of parasitic wasps, although the research on the effectiveness of this method is sparse (Weinzierl and Jones, 1998). These predators need to be released where flies breed multiple times during the season and are best suited for feedlots or moist areas where cattle congregate (Greene et al. 1998). Parasitic wasps will reduce fly numbers by inserting their eggs into immature stages of flies. The emerging wasp larvae will kill their hosts as they grow and feed on them. The predator wasps need to be released regularly to make an impact and they do not sting people or animals. However, they may be negatively affected by the concurrent use of insecticides, such as macrocyclic lactones.

Control of Face Flies: Adult face flies are also difficult to control because they spend very little time on cattle. Insecticides can be applied by cloth wipe to the face of cattle with particular attention to the area around the eyes. Ear tags can provide some relief from face flies though a sufficient level of control is rarely achieved using only ear tags. The most effective means of control is through the use of feed-through insecticides as face flies, like horn flies, develop only in fresh cattle manure. It is important to understand that face flies can travel over a mile, so if an IGR is the only form of fly control, flies on a neighboring property are unaffected and may move in.

Summary: Fly control appears to be an economical practice with multiple tools being available. In some cases using several tools in conjunction with each other may be necessary to economically maintain weight gain.

Sincerely,



Michigan State University

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Annual Rangeland Health, Fire Impacts, Restoration, and Potential New Plant Materials

Thursday, September 10, 2019 8:30 am – 12:00 pm

UC Cooperative Extension Auditorium
2156 Sierra Way, San Luis Obispo

This workshop will discuss the current conditions of Annual Rangelands. We will also discuss the role of fire, and other restoration possibilities. Also, the potential use of new plant materials for pasture restoration, improved forage and fire breaks will be discussed.



Topics covered:

Annual Rangeland Health-Forage Production & Nutrient Availability
Fire Impacts and Use, Yeoman's Plow, Composting
Newly Released Plant Materials, for improved Pastures
Newly Released Plant Materials for Improved Forage and Fire Breaks

Speakers:

Royce Larsen, Ph.D., Area Advisor, UCCE
Matthew Shapero, Area Advisor, UCCE
Kevin Jensen, Ph.D., Research Geneticist, USDA ARS
Blair Waldron, Ph.D., Research Geneticist, USDA ARS

Register at:

HTTP:

Or call Hiromi at 805-781-5940

Hosted by the **University of California Cooperative Extension**
And the **USDA Agriculture Research Service, Forage and Range Research Lab**



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Save the Date!



Fall Meeting

Central Coast Rangeland Coalition (CCRC) and
California-Pacific Section of the
Society for Range Management (SRM)

Join us at the Stemple Creek Ranch in Marin County on
Thursday, October 17, 2019.



Beef, Bees, Trees and Gelato: Doing and Earning More from a Ranch

This joint meeting of the CCRC and SRM will focus on ranch diversification, which promote sustainable working rangelands. We will hear from ranchers and land-owners who have reconfigured their ranches to generate additional income by diversifying the use of their resources. We will hear from land managers who have worked with ranchers to diversify enterprises that promote land management goals and rancher sustainability. We will learn how they identified opportunities for new enterprises and worked through resource and regulatory issues.

Agenda and Registration to come.

Calpac SRM Board will meet prior to the meeting on Wednesday, Oct 16.

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Please Visit: http://ceventura.ucanr.edu/Live_Stock_-_Range_Programs/

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Livestock and Range News is a newsletter published by the UCCE Livestock & Range advisor serving Ventura and Santa Barbara Counties. The newsletter contains research, news, information, and meeting notices related to the areas of livestock production, rangelands, and natural resource management.