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Agriculture and Natural Resources
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Livestock & Range News

TEHAMA, GLENN, COLUSA COUNTIES

August 2017

Alleviating Worries for Nitrate and Prussic Acid Poisoning

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Grazing of warm season grasses such as sudangrass, johnsongrass, and other sorghum relatives presents a risk for livestock to develop nitrite/nitrate and prussic acid (HCN) poisoning. Clinical signs of both intoxications are very similar including respiratory distress, tremors, and convulsions. In most cases, cattle are simply found dead. Post-mortem examination is often non-specific but sampling can be used to diagnose nitrite/nitrate poisoning (best: eye ball) or cyanide poisoning (best: frozen muscle).

However, these are very valuable sources of summer forage because of their high yields. They can also be a very good option for spring planting to prepare a field for a permanent pasture planting in the fall. Rather than avoiding their use, a few key management points can prevent toxicity issues. These tips can help.

Tips to avoid poisoning

- In irrigated areas fertilize with low rates of nitrogen to avoid nitrate accumulation. High rates of fertilization can also cause prussic acid poisoning. Splitting applications of smaller rates over summer is a safer strategy.
- In dryland situations avoid fertilizing with nitrogen, and plant a low prussic acid accumulating variety called “piper” sudangrass. Hybrid forage sorghum varieties should be avoided in the central valley in dryland areas.
- Both poisonings can be brought on by drought conditions. If sudangrass or related plants have been subjected to drought and are then irrigated, wait 14 days before grazing to reduce risk for nitrite/nitrate poisoning. HCN levels should be dissipated in less time.
- Do not graze after a frost.
- Nitrate tends to accumulate in the lower 3 to 5 inches of stems so swathing plants higher when haying will help avoid the most toxic plant part.
- Prussic acid will dissipate when forages are cut for hay (within 24 hours on a hot, sunny day; longer time is needed on cooler days), but **nitrate levels will not**.
- **Do not graze with horses**. Horses are not susceptible to nitrate poisoning but can be affected by cyanide. In addition, a syndrome causing cystitis is possible in horses grazing sorghum family plants.

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For a color copy of this announcement visit the website at: http://cetehama.ucanr.edu/
In addition, the website has many UC publications and information on topics such as livestock, range, natural resources, pest control, and other agriculture and crop production areas

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To simplify information, trade names of products have been used. No endorsement of named products is intended, nor is criticism implied of similar products not mentioned.

Table 1. Interpreting nitrate (differing reporting units) and prussic acid (cyanide) forage tests			
NO3 (dry matter)	***NO3-N (dry matter)***	***KNO3 (dry matter)***	***Feeding Recommendations***
< 5,000 ppm (0.5%)	< 1,200 ppm (0.12%)	< 8,100 ppm (0.81%)	Generally Considered Safe for Livestock
> 5,000 ppm (0.5%) but < 10,000 ppm (1%) ppm	> 1,200 ppm (0.12 %) but < 2,300 ppm (0.23%)	> 8,100 ppm (0.81%) but < 16,000 ppm (1.62%)	Caution: Problems can occur at this level
>10,000ppm (1%)	> 2,300 ppm	>16,200ppm (1.62%)	Do not feed
HCN (Dry matter)			
<600 ppm HCN (dry matter)			Safe
>600 ppm HCN (dry matter)			Do not feed
HCN (variable moisture)			
<200 ppm HCN			Safe
>200 ppm HCN			Do not feed

Lab testing

Lab testing can help decision making on whether forages are safe to feed. The California Animal Health and Food Safety lab at UC Davis can test for both prussic acid (cyanide, $30) and nitrate (nitrate/nitrite, $25) of forages. Samples for HCN should be frozen in an air tight container immediately to prevent dissipation. Lab contact information and submission sheets can obtained at http://cahfs.ucdavis.edu/index.cfm. Your veterinarian and/or farm advisor can assist you in sampling and interpretation as proper sample collection is crucial. If quality sampling is already being conducted it is usually possible to add nitrate testing to list of forage quality parameters, but this is not always the case with HCN. Table 1 provides guidelines for interpreting forage samples.

Blackberry Management

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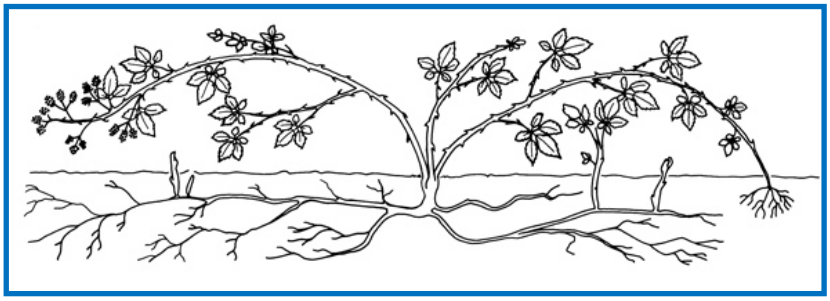
Joseph M. DiTomaso, Vegetable Crops/Weed Science, UC Davis
Paul Kjos, Shasta County Agricultural Commissioner/Sealer of Weights & Measures

Blackberry brambles infest many acres of pasture land in norther California. They quietly invade pasture resulting in a reduction of available forage for livestock. Imagine a field 667 feet by 667 feet (ten acres). This field has blackberries along the fence line out into the pasture ten feet along the entire perimeter of the pasture. The area encompassed by the blackberries is 0.60 acres - over 5% of the entire field. At 10,000 lbs/acre production, that is a loss of 6 AUMs in one season.

Understanding the biology of the blackberry plant will help you better manage this pest:

1. The Seeds are readily spread by wildlife.
2. The plants produce canes from the central cane as well as from rhizomes.
3. A single blackberry plant can live 25 years.
4. They may be self-pollinated or pollinated by honey bees.
5. First year canes do not produce flowers.
6. Second year canes fruit and die.
7. Tips of the first year canes that contact the ground form roots at the nodes.



Vegetative growth of a blackberry plant from a central crown.
Illustration by Seventeenth Street Studios.

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Blackberry Management continued...

Tools available to help manage blackberries include:

1. Burning
   A. Burning blackberries can reduce canopy short term. It is not a good long-term strategy because plants will resprout from the base.
2. Mechanical
   A. Wild Blackberries can be controlled by REPEATED tillage.
   B. Bulldozing can cause resprouting and can spread the pest by means of root and stem fragmentation.
   C. Mowing is not effective because it stimulates formation of suckers from lateral roots and induces branching.
3. Biological Control
   A. There is not biological control method available in the U.S. In Australia, blackberry leaf rust has been released for control of the week. It is not generally considered successful because the rust does not do significant damage to the host. Although the rust was recently found in Oregon it has had sporadic success. It is also in California, but has not been effective.
4. Herbicide
   A. Common Herbicide products include Glyphosate (Round-up®), Triclopyr (Garlon® 4 - 61.6% Triclopyr) or Triclopyr/2.4-D (Crossbow® - 34.4% 2,4-D, 16.5% Triclopyr)

These products behave differently and it is important to apply the product at the right time and at the appropriate rate. Table A summarizes rate and timing, but refer to the pesticide label for specific information.

Table A.

Product	Rate	Water	Timing	Application
Round-up	0.5-1.5%	0.6-2 oz/gallon of water	Late summer/early fall	Spray foliage to wet
Garlon	1%	1.25 oz/gallon of water	Mid-summer and later	Spray foliage to wet
Crossbow	1%	1.25 oz/gallon of water	Mid-summer and later	Spray foliage to wet

As a quick review…

2 cups/pint
2 pints/quart
4 quarts/gallon

8 fluid oz/cup
16 fluid oz/pint
32 fluid oz/quart
138 fluid oz/gallon

When herbicides are used, it is critical to read and follow all label instructions. Understanding the label improves efficacy and assures the product is being applied safely. Some products require a restricted materials permit where others only require an Operator ID. If you have any questions about this, call your local agriculture commissioner's office.

Table B summarizes the products outlined above.

Product	Operator ID	Restricted Materials Permit	Notice of Intent	Use Report
Round-up	Yes	No	No	Yes
Garlon	Yes	No	No	Yes
Crossbow	No	Yes	Yes	Yes

If you are considering spraying blackberries take some time to review and consider the following:

1. Think carefully about the goals for your property/operation.
2. Blackberry control and management requires persistence - be sure you commit the time it takes.
3. Try to work on projects with measurable objectives that move you along towards your goal.
4. Remember the rules - check with your agricultural commissioner locally to make sure you understand the process for obtaining permits, operator ID and submission of reports.

References

DiTomaso, J.M. "Pest Notes: "*Wild Blackberries.*" IPM Education and Publications, University of California Statewide IPM Program. UC ANR Publication 7434. http://ipm.ucdavis.edu/PMG/PESTNOTES/pn7434.html.

Rotary Wiper Control of Smutgrass in Irrigated Pasture

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Now is an optimal time to control smutgrass in irrigated pasture. UC research on controlling smutgrass has led to the testing of a rotary wiper for weed control. The advantage of a rotary wiper is the ability to make herbicide contact with weeds only, as desirable forage can be grazed short and not contacted by the wiper.

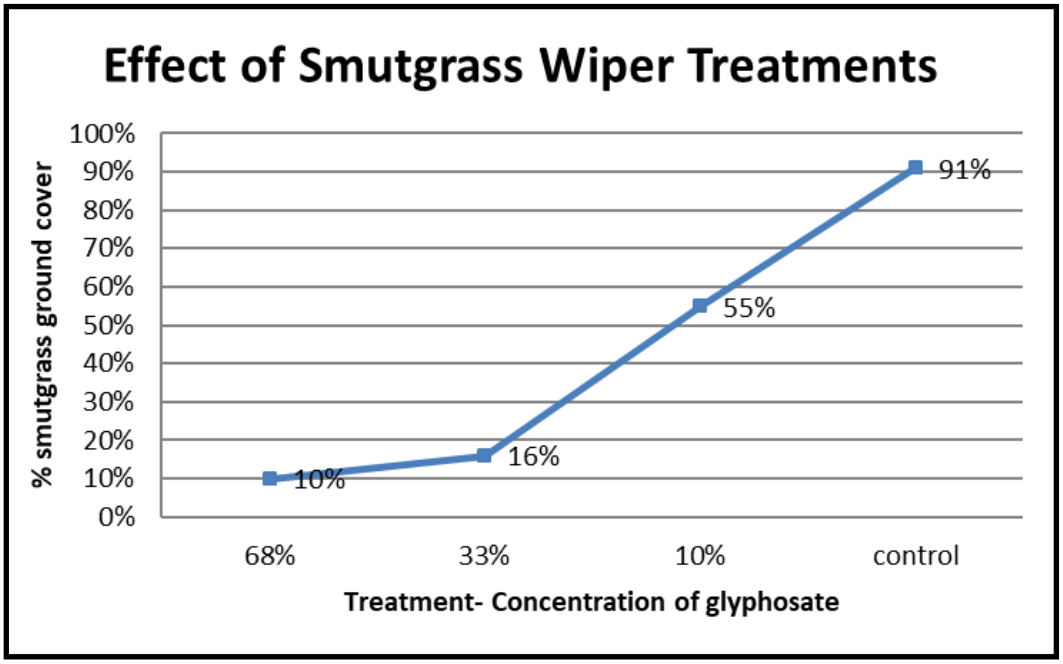
What is a rotary wiper?

The wiper delivers herbicide via an adjustable, carpet-covered spinning drum set to a height that will only contact the weed species. A covered spray boom is on top of the drum. When a button is pressed, herbicide is pumped from the holding tank and sprayed onto the backside of the carpet covering the drum. The herbicide soaks into the carpet and the drum spins backwards, providing optimal herbicide contact. A greatly reduced total spray volume is needed compared to a traditional spray rig because herbicide is only applied to the foliage of the weed species.

Glyphosate Rate

The most common herbicide used in a rotary application is glyphosate (Roundup, Buccaneer, etc.) because the herbicide translocates through plants very well. Glyphosate is non-selective, making it important that desirable forages are grazed below the weed height so that the weeds are the only thing killed.

Since a low volume of herbicide is used, UC research looked at the effectiveness of a variety of glyphosate rates for controlling smutgrass in an irrigated pasture. Rates from 10% (10% glyphosate, 90% water) up to 68% (68% glyphosate, 32% water) were applied to a pasture heavily infested with smutgrass. RoundUp Pro Concentrate was the herbicide used in this trial. All treatments were statistically significant, demonstrating a linear effect, with the control rate increasing with the rate of glyphosate. Rates below 33% were not considered acceptable for smutgrass control, and the research would suggest that rates of 50% to 70% glyphosate are optimal. A separate trial testing a rate of 50% yielded excellent control of smutgrass. The rate used in a rotary wiper application is far higher than the traditional rate of 2% in a spray application, but the lower volume of material used makes the amount of actual herbicide applied very similar between the two methods. Thus the herbicide costs are not generally different between the two application methods.



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As discussed above, none of the trials yielded 100% weed control with a single application. This is because a small number of plants were lower growing and therefore not contacted with the weed wiper. These small plants may require a later application in most fields to increase control and start depleting the weed seed bank. A follow up trial conducted the year following the rate trial referenced above demonstrated a smutgrass cover of 6% in an area treated the subsequent year (area treated twice, 1 time each year) versus 27% in plots treated only one time in the previous trial. Ongoing research is working on controlling the soil seed bank to help prevent smutgrass reinvasion of the pasture.

Rotary wipers are available for rent from the Tehama County RCD if desired. The cost is $50 per day. For more information contact one of the authors at the Tehama or Glenn UC Cooperative Extension Offices (530) 527-3101 or (530) 865-1107, respectively.

Figure 1. Rows of smutgrass comparing treated with a rotary wiper and non-treated

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Consumption of Mineral by Yearling Cattle Grazing Annual Range and Irrigated Pasture

Larry Forero, UCCE Shasta/Trinity, Livestock Farm Advisor
Josh Davy, UCCE Tehama/Glenn/Colusa, Livestock Farm Advisor

Over the years, many livestock operators have shared with us the variation they have experienced with regard to mineral consumption by their livestock. We developed several projects that looked at mineral consumption as a component of a larger question using yearling steers. Yearling cattle are grazed seasonally in California on rangelands in the winter and pasture in the summer. We report the results of two trials from each forage source.

One set grazed annual grassland in the CA foothills while the others grazed irrigated pasture in the northern Sacramento Valley.

Annual Rangeland-Winter Grazed: On Dec. 20, 2016 steers were uniformly shrunk and then weighed and sorted into groups of 35 head. Each set of cattle were assigned an initial pasture rotated on an approximate 35 day interval to minimize any pasture effect. An individual shrink weight was taken during each movement. Average “in” weight was 667 lbs, and final weights on 5/23/2017 were 989 lbs. Cattle were provided an appropriate salt based mineral blend free choice.

Valley Irrigated Pasture Yearling-Summer grazed: On May 28, 2013 steers were individually weighed and in single pasture totaling 48 head. In this trial average “in” weight was 558 lbs and average season ending on 9/10/2013 was 769 lbs. Table 1 summarizes the dates, weights and performance.

Table 1. Summary of weight gain for both rangeland and pasture grazed yearlings.

	Forage	In Wt	Out Wt	Gain	Days	Average Daily Gain
Winter Yearlings	Foothill annual rangelands	667	989	322	151	2.1
Summer Yearlings	Valley Irrigated Pasture	558	769	211	105	2.0

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Consumption of Mineral by Yearling Cattle Grazing Annual Range and Irrigated Pasture continued...

Mineral consumption for both groups was determined by tracking the amount of mineral provided and subtracting what was left over on a 35 (winter) and 21 (summer) day interval. Mineral was always available in adequate supply. Per head mineral consumption by group is shown in figures A and B.

Figure A. Annual Rangeland: Daily consumption of mineral in ounces per steer by 35 day period

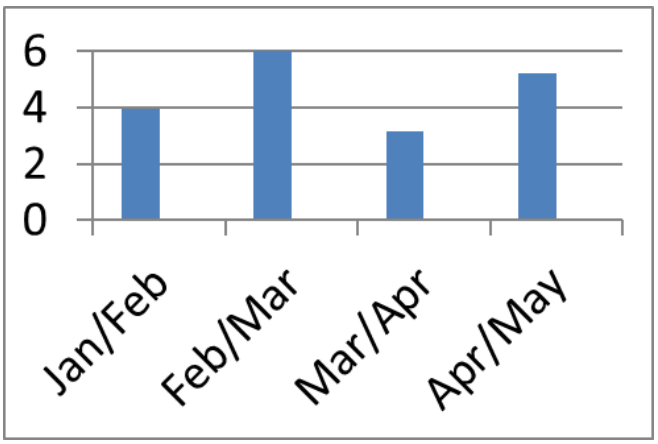
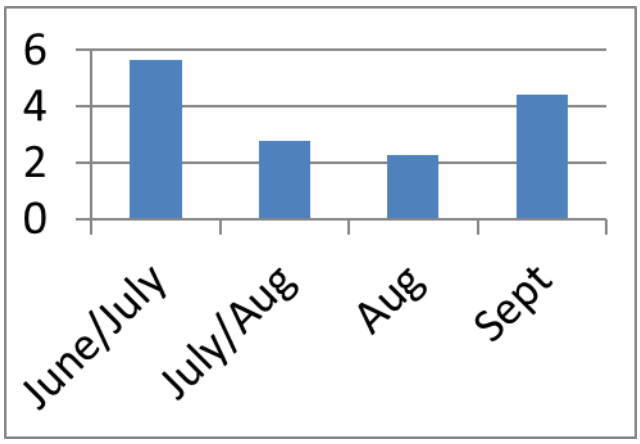


Figure B. Irrigated Pasture: Daily consumption of mineral in ounces per steer by 21 day period



Blood was drawn and analyzed from a subset of the each set of steers. Levels were below what are considered generally acceptable lower limits at the onset of the grazing season. By the end of the season, both groups had reached adequate levels. Table 2 summarizes blood levels

Table 2. Average whole blood selenium levels of both range and pasture grazed yearling

	Levels at onset of season	Levels at end of season
Winter Yearlings	.078 ppm*	0.218 ppm
Summer Yearlings	.06 ppm*	.08 ppm

*generally considered to beneath the lower limit

Summary

The average consumption for the 2017 winter cattle was about 4.5 oz/head/day. The summer cattle averaged about 4 oz for the season. Keeping that in mind:

⇒ Mineral consumption was variable throughout both the winter and summer grazing seasons, but season average consumption matched target levels of each mineral design. The corresponding increases in mineral levels provides evidence that average season long consumption of mineral is a valid assessment measurement to determine if supplementation intake is adequate.

⇒ **Keep the mineral in adequate supply for the cattle all season long**. Limited commitment to having mineral available to cattle at all times may miss the periods of time when consumption would be higher. Additionally, even during low consumption periods, some mineral was always being consumed.

⇒ The cost of supplement is about about $1000/ton ($.50/lbs). The per head daily cost at the 4 oz/head/day is about $0.125—$46/year. In both the winter and summer groups of yearlings, whole blood Se levels improved as the season progressed almost linearly. Work with your veterinarian and farm advisor to determine the current mineral levels in your cattle and develop a mineral supplementation program that meets those needs.

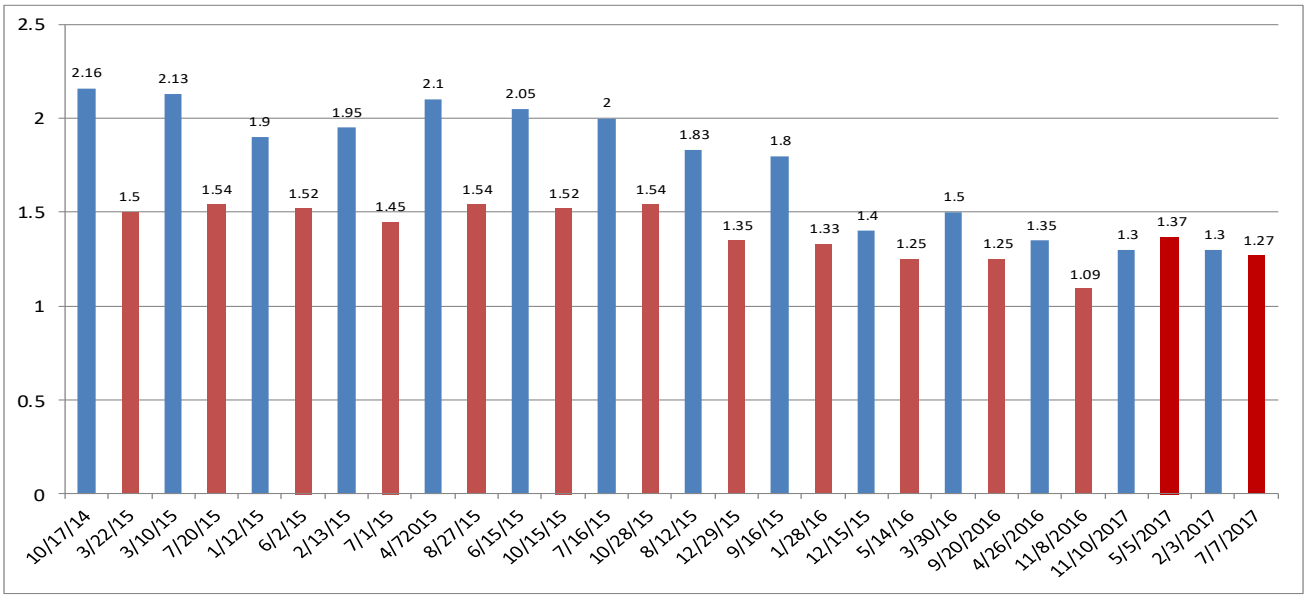
Beef Cattle Market Relationships

Larry Forero, UCCE Shasta/Trinity, Livestock Farm Advisor
Jim Oltjen, UC Davis Animal Science Specialist

The UC Davis Animal Science Department, UC Cooperative Extension and California Beef Cattle Improvement Association continue to support an educational program to help improve California beef cattle producers' understanding of feeding performance and carcass attributes of their cattle. It is called the Ranch to Rail program. Producers sell their cattle to the university, who then feeds and harvests them, and report the feeding and carcass data back to the producer. This data also provides the opportunity to look at the relationship between yearlings off grass and finished cattle.

There is an old adage in the cattle business that goes along the lines of "*you make money when you buy the cattle, not when you sell them.*" Purchasing these cattle from producers, feeding them and then selling them 120 days (or more) later has illustrated this point. The first set of steers weighing 897 lbs was purchased for $2.16/lb. on 10/17/2014. That was ahead of the market collapse beginning in 2015. That set of cattle sold on 3/22/15 for $1.50/lbs weighing 1325 lbs resulting in an over $300/head loss. While many factors influence the profitability of feeding cattle (freight, feed cost, sickness, death loss, etc), the biggest factor influencing the profitability of the steers fed through this program has been the cattle market. Figure 1 shows the relationship between the per pound purchase price and the per pound sale price. Note that from 10/17/16 purchase through 1/28/16 sale, the price per pound difference between purchase and sale was significant.

Figure 1. Ranch-to-Rail Buy/Sell Data in Date order



Profitability on these ranch to rail steers is calculated by subtracting gross sale receipts from cash costs. Only cash costs are considered (feeder cattle, feed costs, vaccine and freight) labor, equipment and capital costs excluded. To illustrate this, the relative stable feed costs on a per pound basis are outlined in table one.

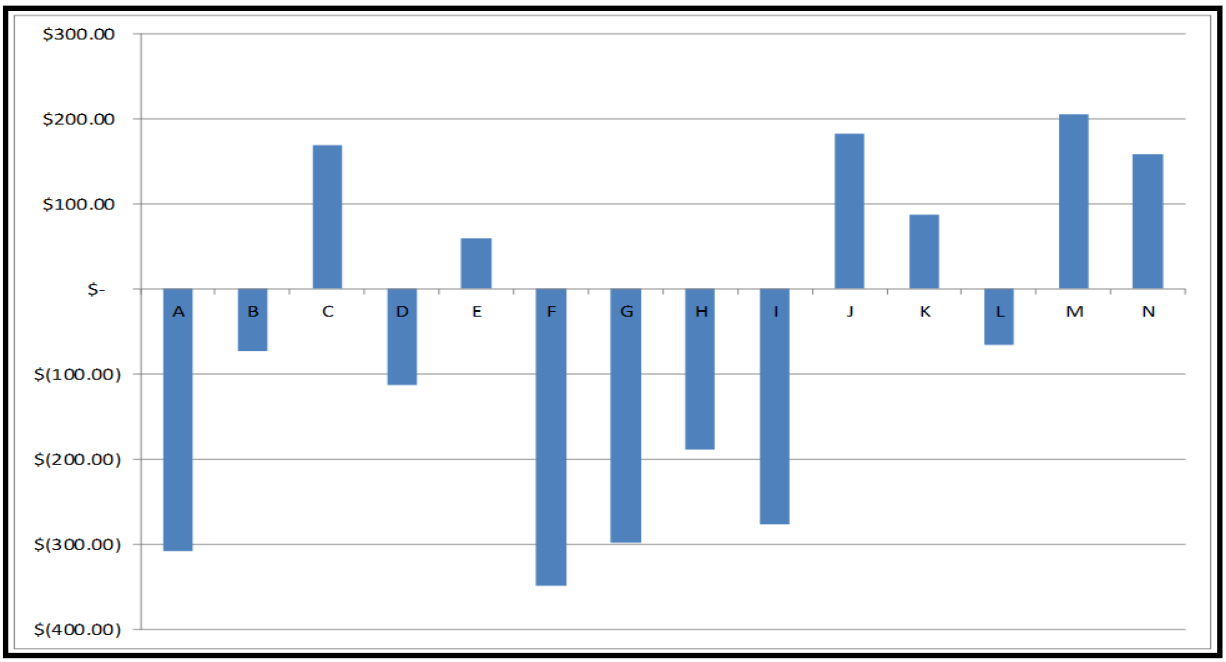
Table 1. Cost of per lb gain by group fed in date order.

A	B	C	D	E	F	G	H	I	J	K	L	M	N
$.76	$.64	$.66	$.62	$.69	$.73	$.64	$.65	$.76	$.76	$.73	$.78	$.93	$.80

Beef Cattle Market Relationships continued...

Figure two looks at the return over cash costs. Feed prices moved up in the past six months making the last two sets of cattle some of the more expensive cattle to feed, however, figure two notes that both sets of cattle made money. These two profitable lots illustrate the significant effect the market has on feedlot profitability.

Figure 2. Return over cash costs in order of sell date



While UC is only in the market for small lots of cattle occasionally, this example demonstrates the drastic influence changing market conditions can have on both yearling and feedlot operators. Of the small numbers of cattle purchased by UC, four of the five sets of cattle purchased since December 2016 have generated return over cash costs. The market, while lower, has been less volatile during this period than 2014 and 2015.

There is no doubt many factors influence the beef cattle market (beef consumption, exports, competitive products, etc) it sometimes feels that cow-calf producers can't exert a lot of influence over the beef market. Here are some things grass based operators can think about:

* Run scenarios through a spreadsheet - https://coststudies.ucdavis.edu Cost savings should always be considered.
* Semen test bulls—**Weaning a calf from a dry cow is tough.**
* Consider pregnancy testing cows- It doesn't cost much more to run a bred cow than an open cow.
* Consider fertilizing- Urea is a little cheaper than a year ago and $30 cheaper than two years ago.
* Price feeds that you haven't considered feeding for years- Commodity price can change every year making new types of feeds feasible.
* Talk to the marketing reps to gain information as they are in the business every day.
* Watch the trends-seasonal trends can be important to pay attention to. How does your marketing window line up?
* Is anything paying a premium (natural, age and source, third party certified, etc.)?
* Quality and reputation matter.
* Preconditioned, vaccination program (i.e., booster shots-including but beyond just an 8 way and 4 way). Preconditioning programs including a boosted IBR/BVD/PI3 modified live vaccine (branding and pre-weaning), and a pre-weaning Pasteurella is desirable.

UC PUBLICATIONS

Find these publications and more at the **UC Cooperative Extension Offices** or the UC Publication Website at http://anrcatalog.ucanr.edu/

Livestock-Poisoning Plants of California

Pub #8398— **FREE**

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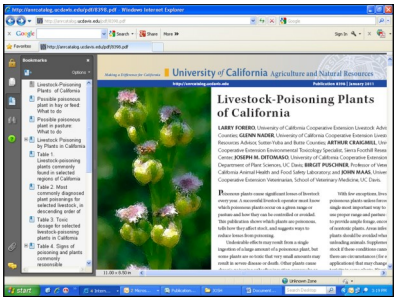
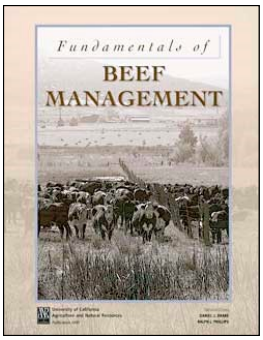


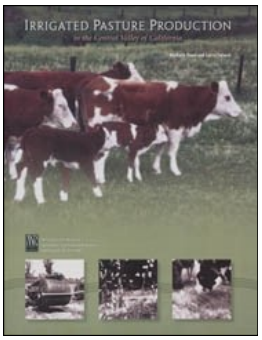
Fundamentals of Beef Management



#3495—
$18.00

This handy guide was developed specifically for small-scale operations and includes everything you need to know to get started in the beef cattle business.

Irrigated Pasture Production in the Central Valley of California



#21628—
$12.00

Irrigated pastures, a mixture of perennial grasses and legumes, can be grown successfully in most areas of the Sacramento and San Joaquin Valleys. This is a step-by-step guide to establishing and maintaining irrigated pastures.

Efficacy of Selenium Supplementation Methods in California Yearling Beef Cattle and Resulting Effect on Weight Gain

FREE

https://tinyurl.com/y9ubb8dt

Forage Seeding in Rangelands Increases Production and Prevents Weed Invasion

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Establishing and Managing Irrigated Pasture for Horses

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TEHAMA, GLENN, COLUSA COUNTIES

Livestock and Range News is a newsletter published by the Farm Advisor's office containing research, news, information, and meeting notices related to the areas of livestock production, irrigated pasture, range, and natural resource management.

In this Issue...

For a color copy of this announcement visit the website at: http://cetehama.ucanr.edu/
In addition, the website has many UC publications and information on topics such as livestock, range, natural resources, pest control, and other agriculture and crop production areas

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