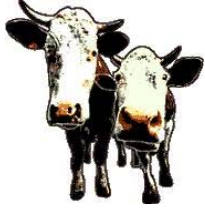


# University of California Cooperative Extension - Solano, Yolo & Napa Counties

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# Local Fodder

November 2007

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### WOOLLY WEED EATERS

We all know livestock as sources of food and fiber, but there is another use for livestock that is not given sufficient attention. Vegetation management are new buzzwords for the specific use of livestock in controlling the amount or type of vegetation. This is most likely a re-birth of an old practice that pre-dates herbicides and intensive fossil fuel use in farming operations.

Interest in using livestock to control vegetation for fire fuel reduction, weed control and manipulating the composition of plant species has been increasing. This is especially true as alternative methods that heavily depend on fossil fuels become more expensive and as the water quality spotlight shines brighter on agricultural production systems.

In response to the growing interest and use of livestock for vegetation management, several research projects are addressing the practicalities and appropriate strategies for

this use of livestock. One project that has captured considerable attention worldwide, but especially in California, is a vineyard grazing project in which sheep are trained not to eat grape leaves so that they can safely graze the vineyard floor without damaging the vines.

### Vines and Ovines

Vineyard floor vegetation is managed throughout the spring months in order to reduce competition with the vines and to reduce the risk of frost damage on young grapes. Traditional vineyard floor management practices have limitations and potentially undesirable consequences. Herbicide applications can reduce surface and ground water quality, especially when applications are made during the rainy season. Volatilization and drift can damage developing grape buds and shoots if applications are made after bud emergence. Mowing and tillage are commonly utilized in late winter or early spring, but can be delayed if excessive rain prevents tractor access into the vineyard, as occurred during the spring of 2005.

Sheep grazing is a practice to manage the vineyard floor that is growing in use and acceptability. Several vineyards in California's wine growing regions have been experimenting with sheep grazing and have adopted the practice to supplement other floor management practices. Sheep can eliminate the need for herbicides, and they can be used in vineyards rain or shine. Currently, the biggest impediment to their use is the fact that sheep like to browse the spring growth of grapevines. Some vineyards work around this problem by using Babydoll Southdown sheep, which are too short to reach the vines. Vineyard managers are pleased with the results, but the use of these miniature sheep is very limited due to their rarity and consequently high price. Other vineyards are using

(Continued on page 2)

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normal commercial sheep, but only by placing electric fencing around each vine row or by limiting grazing to times of the year when the vines are not susceptible to sheep damage, such as between the time of harvest and the emergence of new spring growth.

This problem can be mitigated by training sheep to have a dietary aversion to grape leaves, which will extend the time sheep can graze in vineyards through the spring months when weed and cover crop vegetation grow most vigorously. Expanding the time during which sheep can graze in vineyards should make this practice attractive to more growers. Sheep grazing is a reduced risk alternative to herbicide applications and is an attractive option for sustainable, organic and biodynamic grape production programs, which are becoming more popular among wine grape producers and consumers.

#### Aversion Therapy

The grape leaf aversion training or “therapy” process is done by allowing sheep to eat a sufficient amount of grape leaves and immediately give them an oral dose of lithium chloride (LiCl). The dose of LiCl can be administered in a gelatin capsule or in a drench solution. The effect of LiCl is a temporary stomach ache that the sheep associate with the grape leaves. The technique is no different from the negative association you would have for tequila after a night of excessive tequila drinking followed by that unforgettable nausea. In the case of LiCl, there is no vomiting by the sheep, just a brief period of malaise.

In June 2007 our project team\* concluded a one-year project funded by the University of California that successfully demonstrated that sheep with a trained aversion to grape leaves can be used for managing spring vineyard floor vegetation. Sheep were trained with the aversion in June 2006 and were then used for spring vineyard grazing in 2007. Although the data analysis is not yet complete, preliminary results show that averted sheep have almost no negative impact on the grapevines due to browsing compared to un-averted sheep that significantly damaged the vines.

During the one-year project we discovered that the aversion training definitely reduces the impact on the vines, but considerable attention must be devoted to appropriate grazing management. Sheep can easily lose the aversion if forage quantity and quality are inadequate, forcing them to satisfy their nutritional requirements with grape leaves. We hope to address grazing management strategies and other issues in future research projects.

#### The Bottom Line

Vineyard grazing can create benefits for vineyard managers and sheep producers. The grazing service

provided by a sheep producer has value and is another method of income generation. This benefit has been recognized by the California Wool Growers Association which has expressed their support for this project.

You can learn more about this project using the following web-link:

<http://news.ucanr.org/newsstorymain.cfm?story=977>

#### \*Project Team

Morgan Doran, UCCE Solano County  
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### OUTLOOK FOR COW-CALF PROFITABILITY APPEARS POSITIVE

Prior to the year 2000, cow-calf profitability was very sporadic. From 1980 to 1999, most cow-calf producers were basically in a break-even business. Some years, they endured severe losses, while others were moderately profitable. Over the past seven years, there has been a dramatic difference! Cow-calf producer profitability during this period has been the highest in history, averaging more than \$111 over this time. This compares to an average profitability of only \$9.60 per head during the decade of the 90's and a \$12.73 per head loss during the decade of the 80's.

This reversal in profitability can be attributed to several factors, but one of the primary factors is the number of U.S. beef cows. The number of cows hasn't increased at the same rate as it normally does in times of cow-calf profitability, nor has the most recent cattle cycle followed the same pattern that history would suggest it should.

As noted above, losses were most severe during the decade of the 80's, when the average number of U.S. beef cows was 35.9 million head. With the economic losses producers were incurring, the beef cow herd was projected to decline, which it did from a high of 39.2 million in 1982 to a low of 32.5 million in 1989. Calf prices recovered rapidly during that liquidation phase and maintained themselves during the early 1990's, but declined thereafter. The largest number of beef cows during that decade occurred in 1996 with 35.3 million, the year of the most severe losses when calf prices dropped to an average of \$63/cwt.

The average number of beef cows in this decade is only 33.1 million and for 2007 is 32.9 million. In spite of the economic signal (profitability) for expansion, it has not occurred. And with beef cow slaughter up 11% and heifer slaughter up by 2% during the first eight months of 2007, it doesn't appear that the U.S. cow herd will increase next year either (SOURCE: Cattle-Fax® Update).

**California Certified  
Organic Farmers**

**‘GOING ORGANIC’  
MEETING**



[www.ccof.org/goingorganic.php](http://www.ccof.org/goingorganic.php)

**Date:** November 29, 2007  
**Time:** 8:30 AM – 4:30 PM  
**Location:** Norton Hall, 70 Cottonwood Street, Woodland, CA 95695

**Organic Livestock Production Workshop**

Livestock producers who have considered ‘Going Organic’ will receive information about the requirements and opportunities that this rapidly developing niche market has to offer. A morning workshop will be followed by a three hour Organic System Plan class (OSP 101) for livestock producers.

**Agenda**

- 8:00 - 8:30 Registration and Coffee
- 8:30 - 9:15 **Organic livestock opportunities and processing facilities.**  
Morgan Doran, Livestock Farm Advisor for Yolo, Solano, and Napa Counties
- 9:15 – 10:00 **Organic standards for livestock and farm enterprises.**  
Steve Bird, Celtic Gardens, Camino.
- 10:00 – 10:15 Break
- 10:15 – 11:15 **Pasture management and marketing.**  
Roger Ingram, Livestock Farm Advisor for Nevada and Placer Counties
- 11:15 – 12:00 **Organic buyers and retail opportunities.**  
Wayne Langston, Panorama Grass-Fed Beef  
Robert Duncan, Manager, Meat Department Sacramento Natural Foods Coop
- 12:00 – 1:30 PM Lunch on your own in Woodland.
- 1:30 – 4:30 PM **Organic System Plan (OSP 101) for Livestock Producers**  
A CCOF trainer will conduct a three hour class covering every page and question of an OSP. Each participant will be able to create an OSP for their operation.

**For More Information:** **3.0 hour CE Credit Pending**  
Morgan Doran, UCCE Yolo, Solano County, and Napa, 707-784-1326  
Fred Thomas, 530-819-6958, [fred@cerusconsulting.com](mailto:fred@cerusconsulting.com),  
Or Visit [www.ccof.org/programs.php](http://www.ccof.org/programs.php) to learn more about CCOF’s Going Organic Program.

**Sponsored** by the University of California Cooperative Extension, California Certified Organic Farmers Yolo Chapter, the CCOF Foundation Going Organic Project, and Yolo County Department of Agriculture/Yolo Certified Organic Agriculture with funding from the State Water Board.

## METHODS TO PREVENT COPPER

### DEFICIENCY IN BEEF CATTLE

*Reprinted from the October 2007 issue of California Cattlemen's Association Magazine*

*Written by John Maas, DVM, MS*

Copper deficiency in beef cattle is been recognized as one of the most common disease problems in California. Copper deficiency causes significant economic losses where it occurs. Copper deficiency in cattle is complicated because it can be the result of (1) very low copper in the diet—a primary copper deficiency, or (2) interference with copper absorption in the animal due to molybdenum and/or sulfates in the food or water—a secondary copper deficiency. Regardless of the reason for the copper deficiency, the problems exhibited by the animals can be the same and result in a long list.

- Diarrhea
- Swollen joints
- Illthrift/poor weight gains
- Rear leg weakness or paralysis in calves
- Weight loss
- Infertility
- Light hair coat (achromotrichia)
- Anemia
- Spontaneous fractures (broken bones)
- Reduced immune function

The most common copper deficiency problems seen are light hair coat (Angus are reddish, Herefords are yellow), diarrhea, and poor weight gains (illthrift). One of the most important problems caused by copper deficiency is the reduced function of the immune system. This causes increased illnesses of various types and the cattle do not respond well when vaccinated—further increasing potential problems. This is particularly evident when cattle are weaned or sent to the feedlot. In both cases there is much more illness and death loss than normal. These problems will vary greatly from herd to herd and are not easily predictable. However, when copper deficiency does occur, it invariably causes losses in production, health, animal welfare and profits.

The problem of diarrhea may be easy to see when it is constant and profuse; however, it may only be noticed as soiling of the back of the hind legs and tail. Signs of diarrhea and/or weight loss are not specific for copper deficiency and could be caused by parasites, selenium deficiency, BVD virus, or a number of other conditions. The other signs of copper deficiency (broken bones, infertility, anemia, etc.) that can occur in cattle may be subtle or occur only as the deficiency worsens.

The diet of cattle (pasture, range, hay, etc.) should contain about 4-10 parts per million (ppm) of copper to supply the needs of cattle. Less than this amount results in a primary

copper deficiency; however, if excess molybdenum and/or sulfates are present in the feed or water there can be marked interference with copper utilization by the cattle and copper deficiency will result. Cattle will usually perform normally when the copper to molybdenum ratio is from 5:1 to 10:1 in the diet. When the copper to molybdenum ratio falls to 2:1 or less, one can expect severe interference with copper utilization and a resulting copper deficiency to occur. While molybdenum and sulfates are the most common interfering substances in cattle's diets, other situations can drastically interfere with copper nutrition and these include (1) soil ingestion due to overgrazing, (2) excess cadmium, (3) excess zinc, and (4) excess calcium, particularly as limestone. It is easy to see that copper nutrition in cattle can be complicated by a number of factors. While it is possible to test feed, soil, and water for all the various minerals mentioned above, it is more practical to test the cattle to determine their copper status and make any necessary changes based on those findings.

The University of California's Animal Health and Food Safety and other UC laboratories are available for routine testing of animal and feed samples for copper, as well as a number of other nutrients. Your veterinarian can test animals within your herd for copper status using serum samples (serum is the straw colored fluid in blood left when the red cells are removed). If the serum copper concentration is below 0.5 ppm in your cattle, this is diagnostic of a copper deficiency. Screening the herd with serum copper analysis is quick and inexpensive; however, it is primarily of value to identify advanced deficiency situations. Copper metabolism is complicated by the fact that most of the copper in the body is stored in the liver and it is the liver copper level that gives the true reflection of the copper status of the animal. The serum copper concentration begins to drop only after the liver copper reaches very low levels. That is why serum copper is a good screening tool; however, is not a good measurement for marginal deficiencies or for monitoring the cow herd after supplementation with copper begins. On a practical level this means that liver samples from a few cows (4 to 7) for copper analysis is necessary for monitoring the effectiveness of copper supplementation. This is important for two reasons: (1) to be sure that the copper supplementation method(s) is solving the deficiency, and (2) because excess copper is extremely toxic to cattle, to be sure that excess copper supplementation is not occurring. Liver samples from cattle can be obtained by two common methods: (1) when normal animals are slaughtered a small piece (3 ounces) of liver can be saved and frozen (indefinitely) until analyzed, and (2) your veterinarian can take liver biopsy samples from live cattle (usually 4-7 animals are sufficient) and these can be analyzed. Liver

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biopsy can place the animals at increased risk of Redwater and your veterinarian will usually administer penicillin after the liver biopsy procedure.

Copper deficiency can be managed by supplementation of the cattle by a variety of methods. Any time there are several methods to solve a problem that usually means no method is perfect—this is the case with copper supplementation.

Salt-mineral mixes with copper added

Molasses-based supplements

Injectable copper glycinate

Copper oxide boluses

Copper can be added to salt-mineral mixes to aid in supplementing the cattle. With diagnosed copper deficiency, these mixes are usually formulated to contain 0.2% to 0.5% copper, with the higher levels reserved for severe deficiencies. The above levels of copper in the salt-mineral mixes assume intakes of about one ounce of salt-mineral mixture per cow per day to meet the cows' copper requirements. Also, copper can be added to total mixed rations via a premix or can be added to molasses-based supplements to meet the copper requirements for the cattle.

Injectable copper glycinate has been used successfully for many years to treat and prevent copper deficiency. This product is available only through your veterinarian. Your veterinarian must diagnose copper deficiency in your herd, write a prescription for copper glycinate and send it to a compounding pharmacy where the injectable product is manufactured. This copper injection product provides adequate copper supplementation for four to six months in most cases.

Another method to supplement copper is the copper oxide bolus (Copasure®) which is given orally and usually provides supplementation for 10-12 months. This product works very well; however, it has the disadvantage of having to be given via a balling gun and the capsule is water soluble, so that it will melt if rained on. Whatever the method of supplementation it is extremely important to remember that while a little copper may be good, too much copper can be extremely toxic.

Each of these methods has advantages and disadvantages. The salt mineral mixes are inexpensive; however, they are labor intensive to keep fresh and in front of the animals. Additionally, the consumption of mineral mixes can be sporadic and/or inadequate. Most are formulated to be consumed at 1 ounce per head per day for adult beef cattle. Over consumption can be costly or cause toxicity. The molasses-based supplements promote better consumption; however, they are more expensive. The copper glycinate injections work very well in many cases. They are administered subcutaneously the injection site should be as

clean as possible. Consult with your veterinarian about the proper way to administer this product in your cattle. Rarely, animal may die after the copper injections are given. This is more of a risk with selenium deficient cattle.

There is another product available that contains an injectable form of copper. This is a product called Multi-Min<sup>Ò</sup> and it contains copper carbonate. This product (Multi-Min<sup>Ò</sup>) contains much less copper than the copper glycinate injectable products and there is no data I am aware of to show whether the liver copper concentration increases after injection. The Multi-Min<sup>Ò</sup> product does have selenium injection which should last for about 30 days, based on the scientific literature. The copper oxide boluses work well and provide supplementation for 6-12 months; however, the boluses are sometimes difficult to administer, the cattle can cough them up, and the capsules can break or melt. Again, visit with your veterinarian about the correct way to give this product.

It is important to point out that often more than one of these methods is needed to solve a severe copper deficiency problem. This is where working with your veterinarian is an essential part of this solution. You may need to monitor the copper status of the cattle with liver samples every 1-2 years to be sure the supplementation is enough but not too much to cause toxicity which can easily kill large numbers of cattle.

All of the methods mentioned above can provide excellent supplementation for cattle. However, sheep are much more sensitive to copper toxicity than are cattle and if sheep are allowed access to copper supplements formulated for cattle in most circumstances the sheep will experience significant death losses. When copper is fed in excess of requirements it tends to accumulate in the liver. With minimal stress, the stored copper can cause death in cattle or sheep within a few hours to a few days. As the excess copper being fed accumulates in the liver there are no outward signs in the animals and death can occur at any time. Treatment of copper toxicity is invariably unsuccessful. Therefore, it is extremely important for you and your veterinarian to monitor any copper supplementation program with liver samples on at least a yearly basis. Copper deficiency occurs commonly in California and new analytical methods make diagnosis and control much easier. Working with your veterinarian, prevention of both copper deficiency and the possibility of copper toxicity are relatively straightforward even though the metabolism of copper in cattle can be very complicated.

John Maas, DVM, MS  
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Extension Veterinarian  
School of Veterinary Medicine  
University of California-Davis

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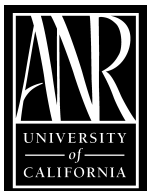
**CALENDAR OF EVENTS**

**Smart Energy Management in Agriculture for Farmers, Dairies, Ranchers and Wineries**  
 Location: St. Anthony's Parish, Winters, CA  
 Cost: \$40, includes lunch, materials and tour  
 For more info, Call 831-763-2111 ext. 4

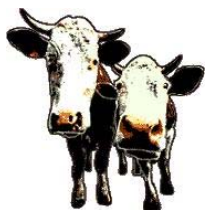
**Organic Livestock Production Workshop**  
 Location: Norton Hall, 70 Cottonwood St., Woodland, CA  
 Cost: Free  
 For more info, contact Morgan Doran, 707-784-1326, mpdoran@ucdavis.edu

November 29

November 13



**University of California  
 Agriculture & Natural Resources  
 Cooperative Extension**  
 501 Texas Street  
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*Local Fodder*  
 November 2007

Si desea folletos en Español, llámame a teléfono 707-435-2459 o 530-666-8739, informame de su nombre y dirección de correo.