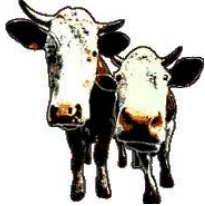




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Local Fodder

December 2001

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BARB GOATGRASS CONTROL

Barb goatgrass (*Aegilops ovata*) is a noxious weed that has persisted in California rangelands for several decades. In the early part of the 20th century, it existed in two foothill counties, but has since spread to 21 California counties. Old studies indicate that goatgrass infestations can reduce the carrying capacity of a rangeland 50% to 75%. In our area (Solano, Napa, and Yolo Counties), barb goatgrass does exist and can be very invasive. This article communicates the results, recently published in *California Agriculture*, on effective methods of controlling barb goatgrass.

Barb goatgrass ranges in height from 6 to 18 inches, has thick seeds held tightly to the stem, and long awns or

needle-like bristles that extend from the seed (See Figure 1). One distinguishing characteristic of barb goatgrass is the tenacity of the seeds when stuck to clothing, shoelaces, and the hair of livestock due to the long barbed awns on the seeds. This characteristic facilitates the dispersal of seeds over long distances.



Figure 1. Barb goatgrass seed head with long awns extending from the seeds.

Many of you may have become familiar with barb goatgrass while walking in a field and suddenly finding yourself in a controlled panic trying to kill a bug that has crawled up your leg. You find yourself swatting your leg, but the darn thing keeps getting higher with every step. Unresolved and mildly worried, you decide the only remedy is to drop your pants and pull out the critter, which ends up being a harmless, but humbling goatgrass seed.

(Continued on page 2)

(Continued from page 1)

While the seed may be harmless in your pants, it can potentially cause severe reductions in forage productivity.

Livestock typically find goatgrass unpalatable, forcing them to selectively consume other grasses and forbs while leaving goatgrass undisturbed. This grazing behavior can promote the growth and spread of goatgrass by removing competing plants, leaving goatgrass with access to more resources such as water, soil nutrients, space, and sunlight. Barb goatgrass can be found in fields as isolated plants, small to large clusters of plants, or as complete infestations in large fields. Once a rangeland is largely infested, drastic measures are necessary to control goatgrass.

In the *California Agriculture* article written by DiTomaso et al. (2001), burning is described as an effective method of controlling goatgrass. Burning infested fields for two consecutive years was found to provide the best control. Goatgrass was not well controlled in areas that were burned only one year and in areas that did not completely burn the second year. Three years after the completion of two consecutive and complete burns, the level of goatgrass control was still 85% compared to unburned areas.

Goatgrass produces two types of seeds that make it an aggressive weed and necessitates two consecutive years of burning to gain good control. Each year, goatgrass plants produce one seed type that germinates the following growing season and another seed type that germinates after one year in the soil. Burning only one year will effectively eliminate those plants that have germinated, but seeds left in the soil usually remain unaffected by a fire and can germinate the following year.

The timing and completeness of burns are also important factors that contribute to the success of controlling goatgrass. A complete burn moves slowly through the field and maintains a sufficiently high temperature around the seed long enough to destroy it. Fast moving fires burn incompletely, leaving unburned patches of grass and burning only the most combustible plant parts while leaving seeds unaffected. Exposure of seeds to the high temperatures of a fire is very dependent on the timing of the burn. Burns should be conducted before the seeds are fully developed and while they are still attached to the stem. Seeds on the soil surface will not be exposed to the higher temperatures of a fire.

In goatgrass, and many other invasive grasses, seeds develop and remain attached to the stems later than in some desirable plants. This provides an opportunity to selectively control goatgrass by burning after seed

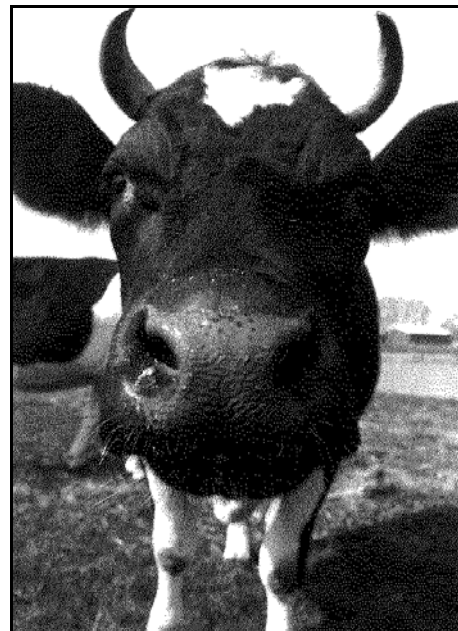
dispersal of desirable plants, and before the complete seed development and dispersal in barb goatgrass.

Other positive effects burning can have on rangelands include the removal of accumulated litter, nutrient cycling, and growth stimulation in perennial grasses. While these additional effects are beneficial for desirable plants, they are also beneficial for other weeds. It is therefore necessary to seed the burned areas with a mix of desirable grasses and legumes (clovers). If left unseeded, other noxious weeds such as medusahead and starthistle can easily invade the area by occupying the gaps where goatgrass previously existed. A seed mix of grasses and legumes should be chosen so that the plants will establish quickly, persist for several years, suppress weeds, and most importantly provide good forage.

When small patches of goatgrass are found, it is important to act quickly and eliminate those plants before they proliferate into a large-scale infestation that is costly to control. Spraying the small patches with a glyphosate herbicide such as Roundup® in the winter or spring will kill the existing plants. A second application is necessary the following year to kill the plants that grow from seeds left in the seedbank. Barb goatgrass seeds usually do not remain viable in the soil more than two years.

Written by Morgan Doran with information taken from the following article:

DiTomaso J.M., K.L. Heise, G.B. Kyser, A.M. Merenlender, and R.J. Keiffer. 2001 Carefully timed burning can control barb goatgrass. *California Agriculture*, Volume 55(6):47-53.



NITRATE TOXICITY

*Reprinted from the November 2001 issue of
California Cattlemen's Magazine*

Nitrate toxicity affects grazing cattle in California every year and drought conditions increase the chance of this problem affecting your herd. This month we will try to answer some of the common questions regarding this potential problem.

What does nitrate toxicity look like in cattle?

Acute poisoning occurs within 30 minutes to 4 hours after ingestion of plants or water high in nitrates. Thus, the problem occurs very quickly and often the cattle are observed to be normal one day and dead the next day. A very early sign is salivation followed by frequent urination. Soon after, the cattle exhibit difficult breathing, increased respiratory rate, and dark brown or "chocolate" colored blood and mucous membranes. The animals then become weak, reluctant to move, and have convulsions before they die. It is common to simply find some of the cattle dead. If pregnant cattle receive a dose that is not quite deadly, they may abort soon after recovering.

What causes the problem?

High levels of nitrates (or nitrites) in the feed or water are the cause of nitrate toxicity. These compounds are converted to nitrites in the rumen of cattle and the nitrites are absorbed across the rumen wall and into the blood stream. The nitrite in the blood reacts with hemoglobin to form a compound (methemoglobin) that can no longer carry oxygen to the cells of the body. Thus the cattle simply cannot deliver oxygen to their vital organs—brain, heart, etc. As you can imagine, death quickly follows a lethal dose.

Where do the nitrates come from?

Nitrates can be high in water sources when this water collects runoff from fertilizers, decaying organic matter, animal wastes or other sources of nitrogen. The nitrates are generally higher after periods of excess runoff—spring snow melt, irrigation runoff after fertilization, or heavy rains. Occasionally, deep, drilled wells can also have high levels of nitrates. Certain weeds are high in nitrates, such as pigweed, lamb's quarters, Johnson grass, nightshade, Russian thistle, and Canadian thistle—all of which occur commonly in California. Additionally, almost any crop can have high nitrate levels; however, Sudan grass hay and oat hay are more likely to have levels of nitrates that are potentially toxic.

How do I know if nitrate toxicity is the problem?

If your cattle die acutely and there has been a recent change in feeding practices—feeding high-risk hay (oat hay, Sudan grass hay, etc), change in water supply, moving from one field to another—you should suspect nitrate toxicity as a problem. There are a number of other common causes of acute death in cattle, such as Redwater, Anaplasmosis, and other toxicities that must be considered. Your veterinarian, working with the California Animal Health and Food Safety Laboratory can perform tests on the dead cattle to determine the cause of death. For nitrate toxicity, samples from the eye of the dead cattle can be very useful to diagnose nitrate problems. Also, rumen samples, feed samples, and water samples are usually analyzed. The diagnosis is not an easy one and if you don't pin it down after the first round of dead cattle, more problems will follow.

How do I treat affected cattle?

There is an antidote for nitrate toxicity. The most common treatment is methylene blue. This is a chemical that restores the hemoglobin so it can carry oxygen again. It is administered intravenously by your veterinarian and must be done very soon after the cattle are affected. This must usually be done within an hour or so of when the cattle first become ill.

How do I prevent nitrate toxicity?

First of all, make sure the cattle are not exposed to weeds that contain high levels of nitrates—pigweed, lamb's quarters, Johnson grass, nightshade, or thistles—in high numbers. Cattle will not eat these weeds in any amount unless forced to by lack of quality forage. Be sure high-risk water is not available to the cattle. If surface water or well water is thought to be a risk, have it tested before allowing cattle access. Thoroughly test any high-risk hays—Sudan grass hay, oat hay—particularly if it has been stressed by drought, high rates of nitrogen fertilization, or frost before harvesting, before feeding.

What levels of nitrates should I be concerned about?

The concentration of nitrates and nitrites is commonly expressed in a variety of different terms. Before making any decisions consult with your veterinarian to make certain of the units of measure and any appropriate conversion. The nitrate concentration can vary tremendously within a stack of hay. When testing hay, be sure to sample at least 40 bales of hay from different parts of the stack. Below is a list of water and forage concentrations of nitrates and associated risks.

Water—ppm (parts per million) Nitrate (NO₃)

0-44	Not harmful
45-132	Slight possibility of harm
133-220	Risky over long period of time
221-660	Some losses expected
661-880	Increased losses expected
880 and above	Heavy, acute losses

Feed—Nitrate Nitrogen (NO₃-N) Content

0.0-0.1%	Safe under all conditions
0.1-0.15%	Safe for cattle EXCEPT pregnant cows
0.15-0.4%	Increasing level of risk, limit amount to keep total diet below 0.15% of Nitrate Nitrogen
Over 0.4%	Do not feed

John Maas, DVM, MS
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RANGELAND & PASTURE WEED CONTROL WORKSHOP

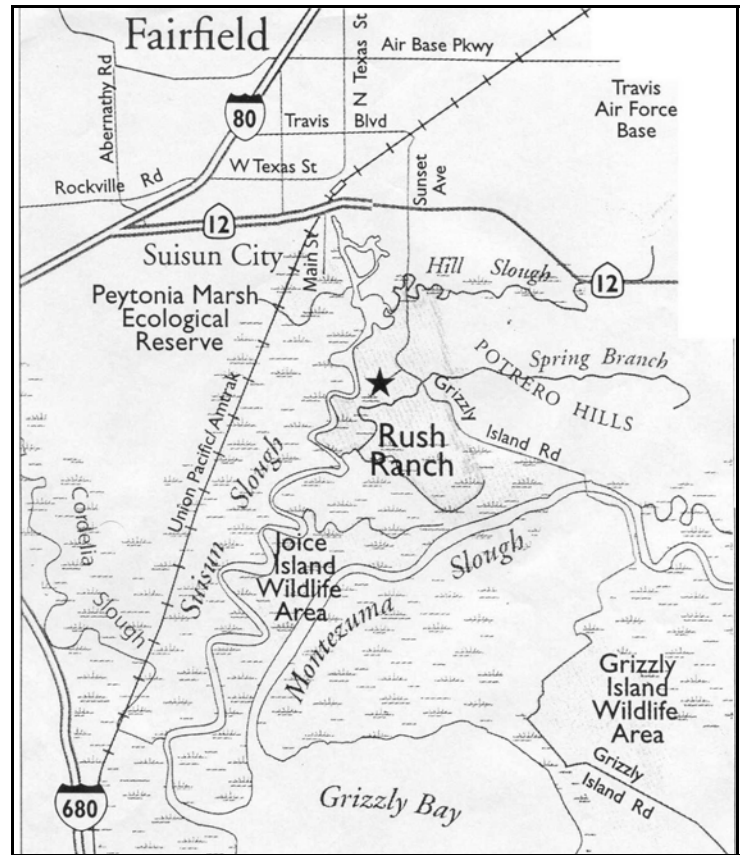
On Wednesday, January 9, 2002, from 9:00 AM to 12:00 PM, the Solano County Weed Management Area (WMA) will host a workshop on rangeland and pasture weed control. This event will be free and will be held at the Rush Ranch, located on Grizzly Island Road, approximately a 10 minute drive to the south from downtown Fairfield (see map on this page).

Joe DiTomaso, a weed specialist from the University of California, Davis, will be the main presenter. The workshop will focus on recommended methods for controlling noxious weeds common to rangelands and pastures. The primary weeds include medusahead, barb goatgrass, yellow and purple starthistle, artichoke thistle, and perennial pepperweed.

Also, a panel of local farmers/ranchers with experience on different methods of weed control will be there to describe their successes and/or problems combating some weeds.

The workshop will be conducted in a barn, so dress warm. Coffee and refreshments will be served. For more information, contact me, Morgan Doran.

Map to Rush Ranch for Rangeland & Pasture Weed Workshop



SURVEY

In the last issue of *Local Fodder*, I sent a survey form and asked that you complete it and send it to me. As you can see, the same survey is attached to this newsletter as well. The response to the last mailing was about 10 %, which wasn't bad, but it also wasn't good.

The intent of this survey is to collect information that I can use to structure my extension and research program. The information from the survey will help me help you, and will also be useful in developing regional and state-wide research activities. We at Cooperative Extension rely on input from our clients to determine research priorities both within and beyond the county borders. If you want to be part of this process, this is a good opportunity to voice your concerns.

For those of you that have returned completed surveys, I thank you for support. For those that have yet to respond, please complete the attached survey and return to the following address:

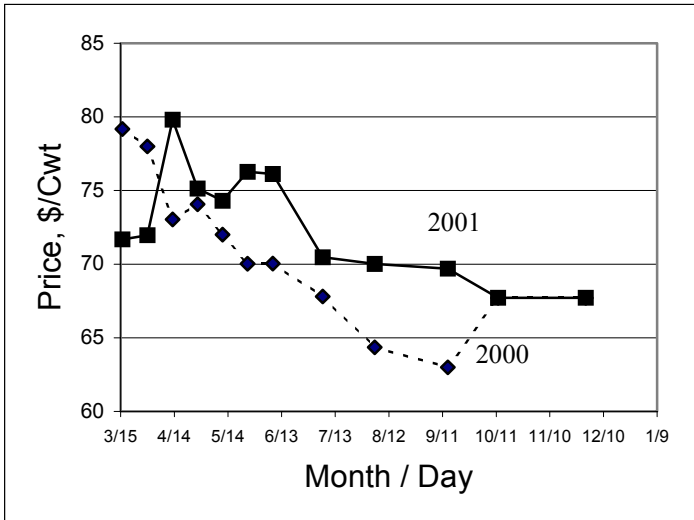
Morgan Doran
UCCE Solano County
501 Texas Street
Fairfield, CA 94533



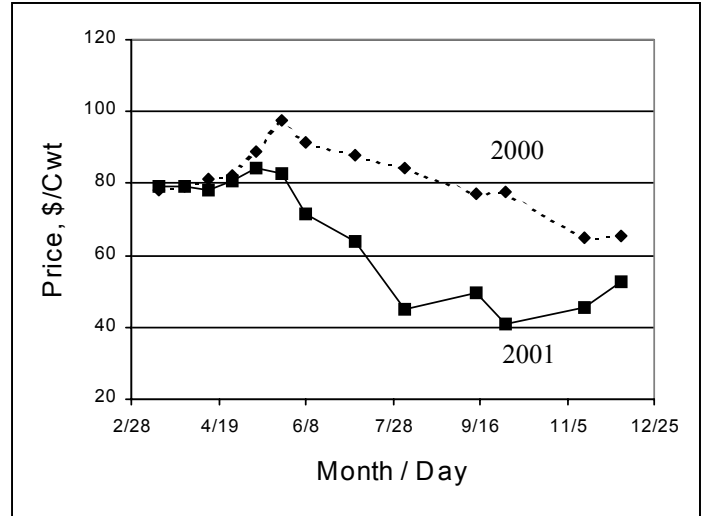
So what if it is cold in the barn . . . at least it'll smell better!

MARKET TRENDS

Live fed steer prices, March - December 2001.



Average price choice slaughter lambs March -December 2001 (Sioux Falls).



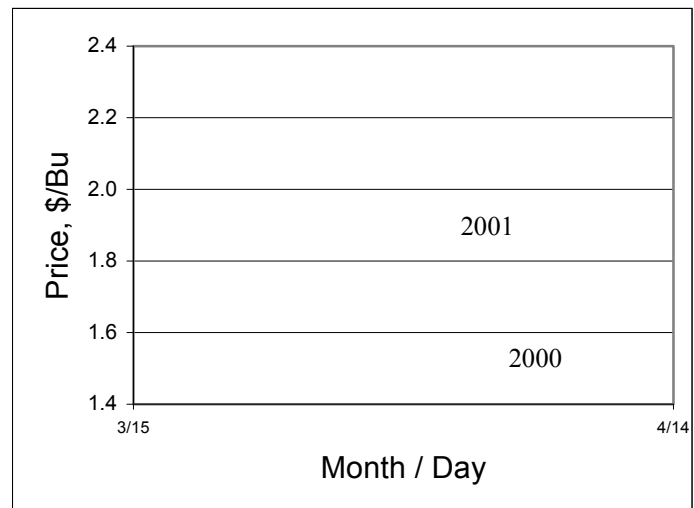
COYOTE RESEARCH

Coyotes have long been a persistent problem for sheep producers in California by preying on lambs and sometimes ewes. Recognizing the severity of the problem, several studies have been conducted at the U.C. Hopland Research and Extension Center in southern Mendocino County. Studies have been conducted to understand coyote behavior and find methods to mitigate their damage to sheep flocks. In the recent issue of *California Agriculture*, two articles describe recent findings and the status of research at the Hopland Center.

In a project to study selective and non-selective coyote removal from sheep grazing areas, the results showed that non-selective removal was essentially ineffective at reducing sheep kills (Jaeger et al. 2001). However, by removing the alpha or dominant pair (male and female) of coyotes, sheep kills either stopped or were reduced for 3 months. After 3 months, sheep kills increased due to coyotes from neighboring territories moving in to fill the gap left by the alpha pair, or by beta coyotes from the same territory of the alpha pair. Their findings suggest that only the alpha coyotes will kill sheep within their territory. In the absence of the alpha pair, other coyotes will eventually become the new alpha coyotes and begin killing sheep.

Selective killing should therefore focus on the alpha male and female coyotes shortly before lambing begins. The trick now is to selectively kill the target coyotes. Livestock protection collars were very effective at killing only those coyotes that were attacking sheep. These collars have small sealed

Omaha corn prices, March - December 2001.



pouches filled with sodium fluoroacetate. The collars are placed around the necks of medium-sized lambs, and when bitten, a lethal dose of the contents is received by the coyote. However, the use of these collars was banned in 1998 with the passage of Proposition 4, despite the extremely strict guidelines for using sodium fluoroacetate.

The challenge now is to find new methods to identify and selectively remove the alpha coyotes.

Jaeger, M.M., K.M. Blejwas, B.N. Sacks, J.C.C. Neale, M.M. Conner, and D.R. McCullough. 2001. Targeting alphas can make effective coyote control more effective and socially acceptable. *California Agriculture*, Volume 55(6):32-41.

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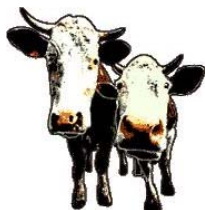
CALENDAR OF EVENTS

Rangeland & Pasture Weed Control Workshop
 Location: Rush Ranch, Grizzly Island Road, Solano County
 Free, contact Morgan Doran for more information at (707) 435-2459
 January 9

Ranch Watershed Planning Course
 Location: Sierra Valley Ranch, Plumas County
 \$ 50 per person, contact Holly George at (530) 283-6262
 Looking for Current California Hay Prices? Check on-line at:
http://www.ams.usda.gov/mrreports/ML_GR311.txt
 California Weekly Hay Report with current hay prices for all of California.
 January 8-10

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Happy Holidays

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