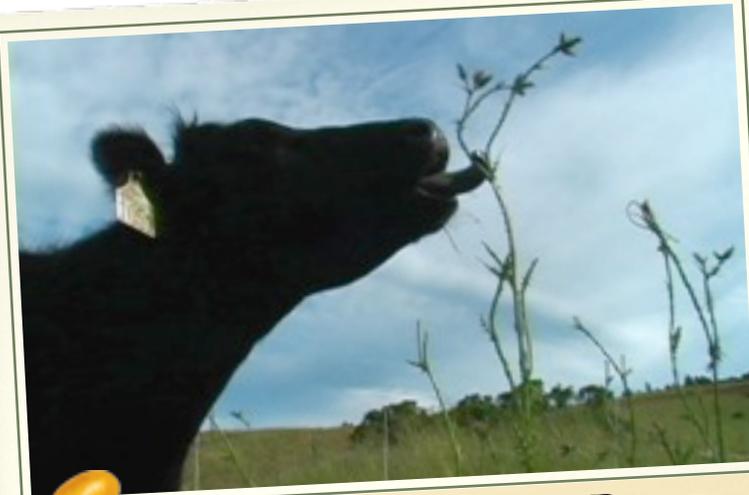


February
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PASA'S 17TH ANNUAL
FARMING FOR THE FUTURE CONFERENCE

WE'D EAT IT!

Turning Cows Into Weed Managers



PRESENTER



KATHY VOTH

WEED EATING COW PREP

WWW.LIVESTOCKFORLANDSCAPES.COM

Those four-legged mowers you've been raising may be your best, least expensive tool yet for controlling pasture weeds.

YOUR PRESENTER

Kathy began her land management career with 12 years at the Bureau of Land Management. Her work with animals as landscape management tools began in 1997 with a research project on how to best use goats for fire prevention. The results of 7 years of research is available as a handbook on CD: "Goats! For Firesafe Homes in Wildland Areas."

In 2004 she began developing steps that anyone could use to train cows to eat weeds. As part of a pilot project at Grant-Kohrs Ranch National Historic Site in cooperation with Utah State University, she taught cows to eat Canada thistle, leafy spurge, and

spotted knapweed. In 2006 and 2007 she refined the process in Marin County, California, teaching cows to eat distaff, Italian and milk thistle, and in Boulder County, Colorado on late-season diffuse knapweed. In 2008 she'll be working with cattle and bison in Montana on yellow toadflax, and at Vandenberg Air Force Base to teach a large herd of heifers to eat black mustard.

Kathy works on and shares ways to harness livestock behavior for vegetation management in pilot projects, training materials and workshops. Visit her website for more info.

In this Workshop

Behavior Principles That Guide Weed Training

Videos of the Training Process

Interviews With Ranchers and Land Managers

Materials for Planning Your Own Training Program

Further Reading & Resources

www.livestockforlandscapes.com
Training DVDs, on-line courses, CDs workshops, and color copies of this handout.

www.behave.net

More information and research on animal behavior

Toxic Plants of North America, George Burrows and Ronald J. Tylr

A Guide to Plant Poisoning of Animals in North America, Anthony P. Knight, Richard G. Walter

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We'd Eat It! Turning Cows Into Weed Managers

**Behavioral
Education for
Human
Animal
Vegetation and
Ecosystem Management**



BEHAVE

A consortium of researchers located at Utah State University studying how animals decide what to eat and where to live.

For more info: <http://www.behave.net>

Understanding behavior is useful

It gives us another effective, efficient tool for managing landscapes and increasing profitability. The seven principles derived from this research are the foundation for understanding how to teach cows to eat weeds.

1. Behavior depends on Consequences

The “foundation” principle. Positive consequences increase the likelihood of a behavior. Negative consequences decrease the likelihood.



2. Early experience matters most.

Young animals learn best from their mothers and what they learn is long lasting.

(Includes video of animals demonstrating the principle)



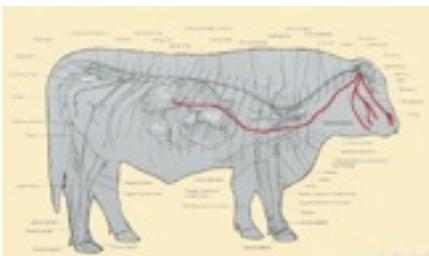
Bodies change as a result of early experience.

With this in mind, we can actually change rumen size, liver function, and neurological connections by providing particular experiences to young animals.



Mother and peers both affect food choices and habits.

In Marin County, California this year, 12 heifers trained in 2006 trained a herd of 120 untrained animals to eat distaff and Italian thistle.



Nutrients increase palatability.

Toxins decrease palatability

3. Palatability is more than a matter of taste.

Nerves from the nose, mouth and rumen all meet in the same pathway in the brain. The brain then catalogs tastes and smells and matches them with the rumens feedback. Thus, foods taste good or bad based on a combination of nutrients and toxins they contain and the animal's physical condition

Sheep Who Love Straw

This video shows two groups of hungry sheep. One group was dosed with a starch solution every time they ate straw so they eat lots of straw because of their nutritional experience. The other group does not eat straw. ***(Includes video of animals demonstrating the principle)***

All plants contain toxins, but animals can eat them anyway.

Very few plants have toxins so deadly they kill immediately. Toxins just decrease how much an animal eats. Experiments and the demonstration video show how animals reduce what they eat or avoid foods after experiencing their toxins. ***(Includes video of animals demonstrating the principle)***

We'd Eat It! Turning Cows Into Weed Managers



4. I've never tried it but I don't like it.

Creatures are "neophobic" or cautious of new foods, habitats or activities, so they may not try them.



How do we get around neophobia?

Researchers have found that having lots of positive experiences with new things makes a creature more willing to try other new things. We also generalize from a familiar thing to an unfamiliar thing based on similar flavors and smells.



5. Variety is the spice of life.

Animals need variety so they can mix foods to meet their individual needs. In fact, animals allowed to mix their own foods gained weight at the same rate as animals on TMRs but at 20% less cost.



Biodiversity - more really is better for everyone!

Variety helps our animals be more productive so we can be more profitable



6. Old dogs can learn new tricks.

We can change a creature's behavior with reinforcement (as with nutrients in weeds) and with punishment (an electric fence that keeps them where we need them to work).



7. Relationships make all the difference.

Since things are related in ways we may not be aware of or understand, we need to consider multiple elements and their possible influence on each other, and examine our assumptions when things don't go as planned.



The principles got me to think in a new way.

If ranchers didn't want goats, and animals learned to eat, and if weeds were nutritious, then I should be able to teach cows to eat weeds, that would save ranchers a lot of money, and we might get rid of weeds.



I developed the original steps at Grant-Kohrs Ranch National Historic Site in 2004

I taught cows to eat Canada thistle, leafy spurge and spotted knapweed.



In 2007 and 2008 I refined the steps working in California with 3 different ranchers.

Cows were trained to eat distaff, Italian and milk thistle. They decided to eat bull thistle on their own. ***(Followed by video of process and interviews with ranchers.)***



Step One: Know Your Weed

*Nutrition = Palatability
Toxins = Reduced Intake*

Scientists at Utah State University have discovered that animals choose what to eat based on feedback from nutrients and toxins in the foods. The more nutritious a weed is, the more likely the animal is to eat it. So it's a good thing that some of our nastiest weeds are just as nutritious as alfalfa!

Keep in mind that all plants contain toxins. Toxins reduce the amount an animal eats of that plant, but rarely will they kill an animal outright. Before you start, be sure you know what your toxins your plant contains so that you can safely feed it to your animals.

Scientists are also discovering that the effects of some toxins can be offset by particular nutrients (provided by supplements or other forages) or by other toxins. If you don't know what offsets what, don't worry. Simply make sure your animals have plenty of variety to choose from. With choice, they can make the right decisions.

Some Other Things to Remember

First Impressions Count: If you're not prepared to make sure your animals get a good first impression, you're not ready to start. If your animal's first experience is negative it will always eat less of the target weed, no matter what it learns later.

Stress Kills: Animals experience stress when moved to an unfamiliar location, when they can't be with those they are used to or when strange people work with them in unexpected ways. Stress increases the effects of plant toxins on the body.

Molasses is NOT the Silver Bullet: An experiment by this same name found that cows that did not have the four days of training to get them over their fear of new things ate very few weeds. In fact, the control group ate only 2 oz of distaff while trained cows ate 81 oz.

Step Two: Work With the Right Animals

Young and female, healthy, and a manageable number and temperament

Younger animals are more likely to try new things than older ones and females are a good choice because they can teach their young what to eat. I suggest starting with year to a year and a half old heifers.

Your animals' nutritional state is key to this process. You may be able to starve an animal into eating something, but the result is reduced weight gain, reduced profits, and an animal who is less likely to try other new foods. So never starve your animals! Cows I have trained have always gained weight at expected rates and suffered no harmful effects from eating weeds.

The process goes faster if the cows you are teaching have known you for a while and are accustomed to being fed by you. I work with only as many animals as I have time to feed and harvest weeds for. You don't have to train your whole herd at once. Research shows that the trained cows will teach the untrained ones!

Step Three: Build on How Animals Learn

*Create positive experiences with new foods
Make the unfamiliar seem familiar*

Just like people, animals may not try new foods even if they're good for them. They're afraid of what might happen. Fortunately, an animal who has had lots of good experiences with trying new foods is less afraid to try other new things. Give your cows good experiences by giving them new, foods like ground alfalfa and rolled grains served in black tubs. After four days of new foods twice a day, they were ready to try weeds!

Cows will also try a new food if it has a familiar flavor or smell. So I cut weeds, spray on a hint of molasses and add other familiar flavors while serving them in black tubs. Don't worry if your cows don't clean their plates the first day. Since they have no food safety labels, they try things a little at a time.

Step Four: Practice in Pasture

Create a good learning environment

No creature changes unless it has to, so a little pressure is part of a good learning environment. Begin in small pastures with a mixture of both weeds and grass so your cows don't just eat the best and leave the rest. This also gives them the time and incentive they need to learn how to harvest some of the more difficult weeds. Remember that animals will have to learn the techniques for harvesting the new forage. For example, it took cows in Marin County, California several days to figure out the best way to wrap their tongues around the very spiny Italian thistle. But once they figured it out, they got better and better with practice. Finally, never expect cows to eat solid stands of weeds. They will ALWAYS need to mix in other foods to be successful, healthy weed managers. And don't forget they'll get better and better with time!

On Weeds

- In general, the later it is in the growing season, the less nutritious a plant is.
- Grazing at bolting or flowering stage is most damaging to the plant.
- Many plants will rebloom after flower heads are grazed off. In some cases the seeds from second blooms are not as viable.
- If you graze after seed set you really aren't going to do much to control your weed.

On Animals

- While younger animals learn more rapidly, you can also use cow-calf pairs. Even if the cows don't eat everything, the young will.

On Training

- While I have a 5 - 8 day training recipe, you can adjust the speed to fit your

needs. If your winters are a slower time, you can introduce your animals to new foods over several weeks or months during the winter.

- If your animals are already familiar with certain flavors or tubs, adjust your training plan to take advantage of that.

On Pasture Practice

- Your animals may need to learn HOW to eat a plant once they are in pasture. Smaller pastures encourage them to practice. Watch for changes in plant shape and size as indicators that animals are practicing and eating.
- A solid stand of your target weed is NOT a good choice. Make sure your animals continue to have positive experiences with the weed by making sure they have a variety of forages to choose from.



- The nutrients and toxins in your plant may determine how much pressure an animal needs to continue eating it. Don't be discouraged if they eat less of it during some times of year. Just adjust your fence size or your expectations.



“The bonus was that they not only ate the milk thistle in the pasture, but they ate the Italian thistle and the black mustard. It was easy! You can do it!”

Joe Morris
Rancher
San Juan Bautista, CA

GO AHEAD! GET STARTED!

Training Recipe*

Heifers

Training Tubs

Variety of unfamiliar foods (1 50 lb bag/ 25 animals/feeding)

Hand pump weed sprayer (food use only)

W/M (75% water to 25% Molasses so it doesn't clog the weed sprayer)

Training Pasture

Once you're sure your target weed is safe, you can begin. Every morning and afternoon for four days feed one unfamiliar food divided equally among tubs. Spritz with W/M.

On the 5th day, add your target weed to the tub, spritz with W/M, and maybe toss in a little of the leftover "unfamiliar" feed. Repeat on days 6 and 7, reducing W/M until heifers are eating the weed plain.

Place heifers in training pasture and watch them eat weeds!

*** This is an abbreviated recipe. Please see complete instructions to ensure success**