



# LIVESTOCK AND NATURAL RESOURCES



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## THE SUSTAINABLE RANCHING RESEARCH AND EDUCATION PROJECT

### WORKING WITH NATURE

#### Ranching Today

Ranching is in trouble. Most ranch businesses in California are **not** profitable. Millions of acres of California rangeland are in poor condition and getting worse. Social and political conflicts surrounding grazing on public lands, animal care and the health and safety of beef are intensifying. These and other pressures are straining relationships within ranch businesses.

In response to these and other issues, the Sustainable Ranching Research and Education Project has been started at the Sierra Foothill Research and Extension Center. The majority of this newsletter will acquaint you with the project and what it has accomplished.

#### The Project

The **Sustainable Ranching Research & Education Project** is a long-term effort to improve the economic, environmental and social

sustainability of ranching. Our mission is three-fold:

- ✓ *Research and develop sustainable ranching techniques*
- ✓ *Increase rancher awareness of sustainable alternatives to conventional practices*
- ✓ *Help ranchers increase the sustainability of their businesses*

The project ranch is a 250 acre watershed at the Sierra Foothill Research & Extension Center near Browns Valley, California (*see photo above*). The ranch is managed as though it were a for-profit cattle business.

Within the constraints of the ranching operation we are conducting practical research on several aspects of sustainable livestock production.

Previous management included fall calving, selling



weaned calves in May or June and using set stocking with occasional pasture rotation.

We are shifting to a spring calving controlled grazing program using 22 rangeland paddocks and 30 paddocks on irrigated pasture. We intend to retain ownership of calves and to eventually finish steers on grass.

The structure and management of this project is based on principles developed by Dr. Stan Parsons and taught at his **Ranching For Profit School**.

Our supplementation strategies are based on concepts developed by Dr. Dick Diven and taught at his

## Beef Cattle Nutrition School.

The livestock handling methods we use were learned from Bud Williams and are taught at the **Bud Williams Stockmanship Schools**.

We highly recommend each of these courses.

## Controlled Grazing

Controlled grazing is a flexible management method that balances plant and animal requirements.

Controlled grazing relies on management, not technology. It uses variable rest periods, short graze periods, high stock densities, and a minimal number of relatively large herds. It requires changing the stocking rate to match annual and seasonal changes in carrying capacity.

Our experience indicates that controlled grazing can:

- ✓ *Improve the efficiency of nutrient cycling*
- ✓ *Increase the effectiveness of precipitation*
- ✓ *Increase the carrying capacity of pastures*
- ✓ *Minimize the need for external inputs (including conserved feeds)*
- ✓ *Reduce overhead costs (including labor)*
- ✓ *Increase profit*

However, these observations are mostly undocumented in California. This project will document the impact of controlled grazing on pasture, animal and economic performance.

## Working With Nature

We believe an important step to improving sustainability of ranching is structuring the ranch business to **work with nature**.

**Conventional ranching is currently structured to fight nature.**

For example, wild grazing animals in California give birth in the spring when forage quantity and quality is high. But many ranchers have timed the peak nutritional demand of their cows (*calving to breeding*) to coincide with the poorest forage conditions of the year. Ranchers provide the needed nutrition in bales, bags and blocks.

**Fighting nature is expensive.** Feed costs are high. The often overlooked costs of labor, facilities and machinery used to deliver the feed are often even higher.

**Using this approach, many ranchers are productive, but few are profitable.**

*Can matching the production cycle of a cow herd to the seasonal forage cycle increase ranch profit?*

Answering this question is just one of the basic objectives of the **Sustainable Ranching Research & Education Project**.

## Research

Our objective is to develop a model of a sustainable ranching business. Within the context of this case study

there are several research projects including:

- ✓ *The effects of controlled grazing on the environment, livestock performance and profitability*
- ✓ *The potential of spring calving on annual rangeland*
- ✓ *The use of "herd effect" to control weeds and rejuvenate deteriorated pasture and range*
- ✓ *Low stress livestock handling techniques*
- ✓ *The use of tools and equipment available to improve pasture management and livestock control (e.g. ram pumps, sling pumps, solar pumps, quick connect, portable watering troughs, wildlife ramps, high tensile electric fencing, spider fencing, etc.)*

This site is a facility for multidisciplinary research on issues and problems related to controlled grazing and sustainable livestock production.

## Education

Several educational programs will be held at the site. These events include field days, tours and the California Grazing Academy.

The **California Grazing Academy**, now in its fifth year, is a three day, live-in camp for ranchers taught by Farm Advisors Dave Pratt and Roger Ingram.

The Grazing Academy emphasizes practical application of controlled grazing principles and hands-on participant involvement. Participants work in small teams and learn by actually applying the principles in real pastures with live cattle. They make and implement needed grazing management decisions, monitor the consequences and make adjustments as needed.

## Support

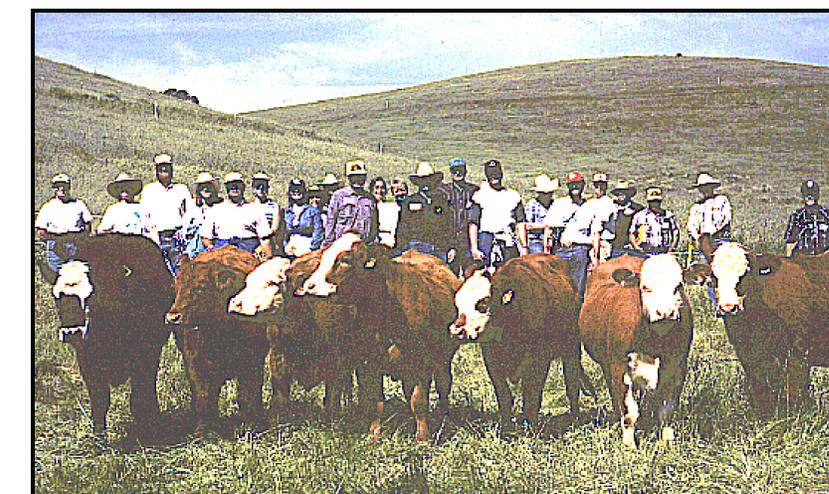
University of California Cooperative Extension Farm Advisors Roger Ingram and Dave Pratt are responsible for all aspects of the project, including:

- ✓ *Securing and managing project funds*
- ✓ *Developing strategic and operational plans*
- ✓ *Designing and conducting the research and educational programs*
- ✓ *Overseeing the daily operation of the project*

Carol Kinyon is a half-time employee assisting in research, site development and the day-to-day operation of the project while attending college.

Our intention is to operate the project as though it were a for-profit business, while conducting practical but high quality research.

We have assembled rancher and academic advisory committees to help us ensure the relevance of our work to ranchers and maintain



1996 Grazing Academy Graduates

high academic standards in our research.

The committees are:

### Academic Advisory Committee

Jim Oltjen, Animal Science, UCD

John Maas, Veterinary Science, UCD

Dan Suther, CDFA Veterinarian, Retired, Redding

Mel George, Agronomy & Range Science, UCD

George Work, Rancher, San Miguel

Bob Sainz, Animal Science, UCD

### Industry Advisory Committee

Marcus Haney, Rancher, Oakdale

Harold Hunt, Rancher, Arcata

The project is currently supported by a three year grant from the University of



California Sustainable Agriculture Research & Education Program (SAREP) and a three year grant from Western Region Sustainable Agriculture Research & Education program (SARE).

The California Grazing Academy is supported by producer registration fees and a small grant from SAREP.

## ACCOMPLISHMENTS

The following has been accomplished on the project site since spring 1996.

### Fencing

The 250 acre site has been subdivided into 22 rangeland and two irrigated pasture paddocks.

The irrigated pasture paddocks are further subdivided with the use of temporary electric fencing for strip grazing. Electric fencing has been used powered by a solar energizer.

Paddock subdivision was accomplished with two wire fences on rangeland and one wire fence on irrigated pasture.

Fencing materials used were spider fencing, a lighter gauge high tensile wire that minimizes the need for bracing. Nine cell centers were established for moving cattle from paddock to paddock. Four of the centers contain a central watering point.

High tensile wire cattle guards were constructed to minimize the need for gates crossing developed roads within the project site.

### Water

Livestock water was developed for the entire area through the use of gravity pressure.

Above ground one-inch polyethylene pipe was used to transport water. By the middle of the summer, water was heating to 120° in the pipe. This necessitated the need for burying 4000 feet of pipe to reduce the water temperature to a drinkable 80°F (see photo bottom left).



High tensile wire cattle guard.

The above ground one-inch polyethylene pipe came in 600 foot sections. Two types of couplers were used— PVC and polypropylene.

PVC did a good job of holding the pipe sections together. Polypropylene did not as the weather turned hot. When it does not hold, then the pipe uncouples and you have no water.

Another learning experience was using clamps. When I bought the pipe, the company gave me clamps that were approximately one-quarter inch wide. This did NOT do a good job of holding

the pipe.

Using a wider clamp solved problems with pipes coming uncoupled (see photo bottom right). Two clamps were used on each side of coupler. You should not put the clamps right at the edge of the pipe to tighten onto the coupler. Back off approximately one-eighth inch and you will get a better seal.

When using two clamps side by side, stagger them so the tighteners are on opposite ends from each other. You get better torque and seal. Plus, if you are troubleshooting and all you have is a fence tool, you can still tighten the clamps if needed. Otherwise, you have to have a screwdriver or a



Different width clamps – wider worked better.

Swiss Army knife (see photo to right).

Water troughs include: round galvanized, barrels cut in half, cool spring (*designed to keep water cool*), and Python portable water troughs with quick connect hydrants. Changes in design of the quick connect hydrants have been necessary since they were constantly breaking.

Jobe valves are used in the permanent troughs. These valves are full flow until the trough or storage tank fills. They have worked very well. One problem encountered this winter was the filters becoming clogged. It is not difficult to clean the filters, but you do need to be alert.

### Pumps

We are trying out two kinds of portable pumping systems for delivering water.

One of these is a portable solar pump called the M3 (see photo to right). It is rated to pump 2.5 gallons per minute with 23 feet of pumping head. With approximately 18 feet of pumping head, we are getting 3.5 gallons per minute. This is a tool with a lot of potential.

We also use a ram pump (see photo on page 6) during the Grazing Academy to pump water. A ram pump uses the gravity force of water to pump water uphill. It needs a minimum of 4.5 feet of fall to work. We have been able to pump 15 gallons an hour with 25 foot of lift.

A ram pump will work 24 hours a day. It also makes a very pleasant sound as water moves through the pump.



*Stagger clamps so problems can be easily handled.*

Ram pumps have been around for a long time — but they are not used enough. Very dependable.

## Plants

### Transects

A transect is essentially a straight line between two permanent end points that are established. Every 10 feet, a metal frame is dropped and several items are recorded including:

- ✓ *Type of vegetation*
- ✓ *% cover*
- ✓ *% bare ground*
- ✓ *Presence of erosion*
- ✓ *Distance to nearest perennial*
- ✓ *Species identification*

Permanent end points allow



*M3 solar pump*

us to come back each year and get the data from the same area. There are currently 22 rangeland and eight irrigated pasture transects.

### Photopoints

Photopoints have been established at 12 locations within the project area. Two shots are taken at each point — one across the horizon with no more than one-third sky and a distinguishable feature and one taken at a 45° angle looking into the vegetation after walking 10 paces. The photos are taken in late December of each year.

### Grazing Plan

A grazing plan is both a roadmap of where we are going and a way to record what actually happened. This is one of the most critical components of a successful controlled grazer.

On the plan, significant events such as calving, breeding, weaning, and other significant events are noted.

Each paddock is represented as well as all the months and days of the year. Projected grazing and rest periods can be mapped out in pencil. Actual graze and rest periods are marked in pen. Also recorded are days grazing, number of stock days, severity of use, and rainfall.

Normally, the grazing plan is kept on a 11" X 17" piece of paper. With so many people working on the project, Dave Pratt came up with a more workable solution. He put the plan on shower board attached

to a 4' X 8' sheet of plywood. Thick plexiglass was then screwed on to make it weather proof.

Recording of projected and actual use is done with grease pencils. The increase in size gives everyone a central point to see what is going on and has greatly enhanced the effectiveness of the grazing plan.

## Animals

### Nutrition

Forage samples are being collected on a monthly basis and sent in for analysis with results coming back on energy, protein, calcium, phosphorous and nine trace minerals.

By taking these samples, we can then formulate a supplement that only provides what the forage does not. We are demanding all of our energy from the land. We will supplement as needed for protein, vitamins, and minerals.

### Body Condition Scoring

We can use body condition (*measure of stored body fat*) as a tool to help make up for energy shortfalls. The key is making sure the cow is in an adequate body condition at the time of calving. Cows are weighed on a monthly basis and body condition scored.

In addition, we also weigh the calves on a monthly basis.

## Personal Comment

I have found the project to be both the most rewarding and challenging undertaking in my entire Extension career.

This really hit home during early July 1996. Due to the water pipe being above ground, water temperatures in the trough were reaching as high as 120°F. **The cows could not drink.**

While it had nothing to do with research, this problem had to be solved in order for the project to continue.

Several alternatives were considered. The one that was implemented was burying 4,000 feet of pipe. Trenching was done by hand by both advisors with a hired person following behind to shovel soil back over the pipe.

By the end, everyone was exhausted. We had



succeeded in dropping the water temperature to a drinkable 80°. It really made a person appreciate the seemingly simple act of cattle drinking water.

## Final Thoughts

We appreciate any questions or feedback you may have about the project. It is designed to provide you with practical information that you can use on your place.



Dave Pratt body condition scoring.

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