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# Livestock Management During Drought

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**D**rought years create severe hardships for the livestock industry. Forage production is reduced, putting the amount of residual dry matter well below minimum recommended threshold levels. Residual dry matter is the dry plant material remaining from the previous year's growth that provides favorable micro-environments for early seedling growth, soil protection against erosion, soil organic matter, and a source of low-quality fall forage for livestock (Clawson, McDougald, and Duncan 1982).

The low levels of residual dry matter that result from continuous drought can create a situation similar to that following a wildfire. Besides reducing the current year's forage, a wildfire reduces forage production in the following season and shortens the adequate green forage period. With less forage available, stocking rates need to be reduced. In the growing season after a fire, forage production is reduced by 30 to 50 percent and the species composition shifts mostly to forbs. In the second growing season after a fire, forage production is still about 20 percent less than on an unburned site. Only in the third growing season after a wildfire will forage production resemble that of an unburned site (McDougald, Frost, and Clawson 1991).

Sound rangeland and livestock management strategies can help a livestock operation survive a drought. As no single management program can be applied in all situations, you must carefully evaluate each recommendation in terms of its cost and the expected return. Each livestock producer must evaluate his or her management options and select those best suited to the unique conditions surrounding his or her operation. The following is a series of range and livestock management recommendations that you may consider.

## RANGE MANAGEMENT RECOMMENDATIONS

**Move cattle to pastures** with scattered blue oak to make more forage available to grazing livestock. In California, for areas of 20 inches of annual rainfall or less, early season forage production and total forage production generally are greater beneath the canopies of blue oak than in adjacent open areas.

**Visually evaluate the available forage** remaining in each pasture. Map these areas into categories of high, moderate, and low forage following the guidelines for residual dry matter (Clawson, McDougald, and Duncan 1982; Frost, McDougald, and Clawson 1988). Use these maps to locate supplemental feeding areas or use electric fencing to improve livestock distribution to improve the efficiency of use of existing forage or residual dry matter.

**Use nitrogen fertilization** if and when rains occur. Nitrogen applications produce a quick forage production response and increase the quantity of protein in the forage. For best results, apply nitrogen to open rolling sites. The benefit of fertilization may be limited in areas of less than 12 inches average annual rainfall.

**Poisonous plants** become a bigger problem during drought. Locate all areas with poisonous plants and monitor them closely or exclude cattle from them if possible. When especially hungry, animals will eat poisonous plants that they otherwise would not consume.

**Utilize pastures** with predominantly south and west aspects early in the grazing season. The forage on these areas will mature and dry earlier than the forage on north- and east-facing pastures. This grazing strategy will increase the period in which adequate amounts of green forage are available.

**Swales** have deeper, more fertile soils with better water-holding capacities, and so are the highest-producing forage sites on annual rangeland. During the winter season, however, cold air can settle into the low areas, restricting plant growth. By placing temporary fences around large swales and restricting their use until temperatures warm up, you can give the plants a photosynthetic advantage, enabling them to produce nearer to their potential. Since plants on these areas are the last to mature and dry, your efforts to delay grazing of swales may further extend the period in which large amounts of high-quality green forage are available.

**High-quality, accessible water** is extremely important to livestock under drought conditions. Consider developing all possible sources of water: develop springs and seeps, install water tanks, build ponds or reservoirs, and drill wells as appropriate. You may even want to haul water a short distance to permit livestock to harvest the forage in a certain area, but this should be used as a last resort as it is costly, time-consuming, and should only be considered as a temporary solution.

## SUPPLEMENTAL FEEDING RECOMMENDATIONS

**Supplemental feeding** is normally practiced to maintain herd performance as indicated in reproductive rates and weaning weights. During drought, ranchers provide additional supplemental feed to offset the reduced production of forage. Supplemental feeds provide additional protein and energy to livestock. Common protein-rich supplements include cottonseed, soybean, linseed, and safflower oil meals or products containing these feeds. Well-cured green leafy alfalfa hays cut in the early bloom stage are also high in protein. These high-quality hays will provide adequate protein for all classes of livestock when fed in adequate amounts.

**Common high-energy feeds** include grains such as barley, corn, milo, and wheat. Molasses is an excellent energy source, and also acts as a binder to keep dust down in ground and pelleted feed mixes. It also increases the palatability of feed mixes.

**Liquid supplements** can be formulated to provide either protein or energy. These liquids are commonly used when low-quality dry forage is available in adequate amounts. When drought conditions reduce forage production and substitute feed is required, these supplement forms are only recommended if they are provided along with low-quality roughage. Do not consider using liquid supplements if it would take more than 2 pounds of the supplements per cow per day to maintain desired livestock performance.

**If animals are exposed to severe drought conditions** for some time, their maintenance requirements will decrease and a lower feed level will be adequate. Gradual reduction of feed levels is important as it will allow animals to adjust to the lower level with little pronounced effect. However, the condition of weak animals should not be allowed to decline, making them weaker, as greater quantities of feed will then be required to bring them back to good condition. Animals losing 15 to 25 percent of normal body weight are weak and will recover slowly (Young and Scrimshaw

1971). Animals that lose 30 percent or more of their normal body weight will nearly always die as a result (de Calesta, Nagy, and Bailey 1975).

**Feeding the standard daily requirements** every other day is more effective than a daily feeding of reduced amounts. Less-frequent, larger feedings allow the weaker animals as well as the stronger animals to get their fill. This practice will also save on labor costs.

**Under normal feeding conditions**, animals retain some of the essential ingested minerals in their bones. During short deficiency periods these minerals can be depleted. Under most dry feed conditions cattle should receive calcium and phosphorous supplements. During prolonged drought it becomes even more important that cattle receive these two minerals. This is particularly important for young, growing animals, pregnant females, and lactating heifers and cows. Vitamin A is critical during drought. Dry feed contains very little vitamin A. You can provide vitamin A by having some green hay in the ration or by adding a stable form of vitamin A to the feed mix. Another option is injectable vitamin A. Fortunately, animals that have been on green pasture for some time usually will not experience vitamin A deficiency for 4 to 6 months when placed on a vitamin A deficient ration.

**During drought conditions** cattle may be fed a variety of other feedstuffs. Low-quality roughages such as cereal, straw, milo or corn stover, and cottonseed hulls are good sources of roughage. Poultry manure and litter are sources of nitrogen.

**When feeding the animals**, reduce the distance the animals must travel insofar as possible. Walking in search of feed and water can use up as much as 30 percent of the energy a cow derives from feed. This factor must be balanced against the need to utilize existing range forage efficiently.

**Extremely cold weather** can also increase energy requirements. Under such conditions, roughages such as hay and straw should be fed, as animals will produce more body heat on these feeds than on concentrated feeds such as barley or corn.

**Try not to buy weed-infested hay.** If you must use weedy hay, avoid areas with late spring moisture such as swales, seeps, springs, and streams. These late-season wet areas increase the risk of weed establishment. Monitor all feeding sites for weeds, and treat weedy areas to control infestations.

## LIVESTOCK MANAGEMENT RECOMMENDATIONS

**Formulate a selling policy** to help you deal with classes of animals to sell and the rate at which you should place them on the market. Check all heifers and cows for pregnancy and cull those that are open, saving the most desirable and younger cows. By carrying these animals on minimal rations, you will be able to save valuable breeding stock and replenish the herd after the drought has broken.

**Wean calves** as early as possible. This is important as it will allow heifers and cows to stay in better body condition. Weaning ages can be classified into three groups:

6 months or older

3 to 5 months

6 weeks to 3 months

Calves weaned at 6 months or older perform well on high-quality roughage. Calves weaned at 3 to 5 months can be raised on good-quality hay and grain. Calves weaned at 6 weeks to 3 months require diets higher in grains and a higher quality of hay, but do not hesitate to wean calves regardless of age in order to reduce stress on the cows.

**Group the herd** according to nutritional needs. This will allow for proper feeding of each group and provide an easier means of assessing livestock condition. The following is an order of priority, from highest to lowest:

1. Calves under 3 months
2. Lactating heifers
3. Calves 3 to 6 months
4. Lactating cows
5. Heifers or cows in the last third of the gestation period
6. Calves 6 to 12 months of age
7. Calves 12 months or older
8. Heifers or cows in early and mid-pregnancy
9. Bulls

Groups low on the priority list can withstand longer periods of nutritional stress. These animals should be given lower priority in the feeding program. Those animals most likely to die during drought conditions are young calves and pregnant or lactating heifers and cows. These animals should receive the highest priority and be fed the best feed. Bulls should remain in fair condition, but just prior to the breeding season they need to be in good condition.

**Observe all classes of livestock** for symptoms of internal and external parasites. Parasites are a more serious problem when cattle are under stress than under normal conditions. A good parasite control program is even more important during drought, but be sure your cattle have internal parasites before you treat, as deworming is expensive in terms of both labor and materials.

## **ASSISTANCE AVAILABLE**

The USDA Livestock Assistance Program is initiated locally through the Executive Director of the Farm Services Agency (FSA) when a substantial loss (greater than 40 percent) of livestock feed occurs. In addition, the President of the United States or the Secretary of Agriculture must designate the county for disaster assistance. The program provides cost sharing for the purchase of supplemental feed. Information on this program is available through your local FSA office.

When you are formulating a drought program for an individual livestock operation, you can also get assistance from range and livestock professionals in the University of California Cooperative Extension.

**REFERENCES**

- Clawson, W. J., N. K. McDougald, and D. A. Duncan. 1982. Guidelines for residue management on annual range. Oakland: University of California, Division of Agricultural Sciences Leaflet 21327.
- de Calesta, D. S., J. G. Nagy, and J. A. Bailey. 1975. Starving and refeeding mule deer. *J. Wildlife Management* 39:663–669.
- Frost, W. E., N. K. McDougald, and W. J. Clawson. 1988. Residue mapping and pasture use records for monitoring California annual rangelands. University of California Range Science Report No. 17.
- McDougald, N. K., W. E. Frost, and W. J. Clawson. 1991. Estimating the cost of replacing forage losses on annual rangeland. Oakland: University of California, Division of Agriculture and Natural Resources Leaflet 21494.
- Young, V. R., and W. S. Scrimshaw. 1971. The physiology of starvation. *Sci. Am.* 225:14–21.

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You'll find detailed information on many aspects of livestock and range management in these titles and in other publications, slide sets, and videos from UC ANR:

*Annual Range Forage Production*, publication 8018

*Annual Rangeland Forage Quality*, publication 8022

*Balancing Beef Cow Nutrient Requirements and Seasonal Forage Quality*, publication 8021

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