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Coping with Five Years of Drought in the Central San Joaquin Valley

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Five consecutive years of drought in the central San Joaquin Valley are creating a severe hardship for the livestock industry. Lowered forage production has resulted in residual dry matter well below the minimum threshold levels for California. Residual dry matter is the dry plant material left on the ground from the previous year's growth that provides favorable micro-environments for early seedling growth, soil protection, soil organic matter, and a source of low quality fall forage for livestock (Clawson, McDougald, and Duncan 1982).

Currently low residual dry matter levels resulting from continuous drought are creating a situation similar to that following a wildfire. Besides reducing the current year's forage, a wildfire reduces the forage production in the following season and shortens the length of adequate green forage period. Stocking rates thus need to be reduced. In the growing season following a fire, forage production will be reduced by 30 to 50 percent and species composition will shift primarily to forbs. In the second growing season, forage production will still be about 20 percent less than on unburned sites. Only in the third growing season after a wildfire will forage production resemble that of unburned sites (McDougald, Frost, and Clawson 1991).

Sound rangeland and livestock management strategies can help the livestock producer endure the drought. As no specific management program can be applied in all situations, each recommendation should be carefully evaluated in terms of cost in relation to expected return. Each livestock operation must evaluate its management options and select those best suited to its specific situation. The following is a series of range and livestock management recommendations that may be considered.

Range Management

Move cattle to pastures with scattered blue oak. In much of the state, early season forage production and total forage production is 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 et al. 1982, Frost et al. 1988). Use these maps to locate supplemental feeding areas and electric fencing to improve livestock distribution so existing forage or residual dry matter will be used efficiently.

Use nitrogen fertilization if and when rains occur. Nitrogen results in a quick forage production response and increases the quantity of protein in the forage. For best results, nitrogen should be applied to open rolling sites. The benefit of fertilization may be limited in areas of low average 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. Hungry animals will eat poisonous plants that they normally do not consume.

Utilize pastures with predominantly south and west aspect early in the grazing season. The forage on these areas will mature and dry earlier than that on north and east exposures. This grazing strategy will lengthen the period in which adequate amounts of green forage is available.

Swales, due to their deeper, more fertile and better water holding soils, are the highest forage producing sites on annual rangeland. However, during

winter the cold air settles into the low areas, restricting plant growth. By fencing large swales and restricting their use until temperatures are warm, the plants will be given a photosynthetic advantage enabling them to produce near their potential. Since plants on these areas are the last to mature and dry, delaying their use may further extend the period in which large amounts of high quality green forage is available.

Providing high quality and accessible water to livestock is extremely important under drought conditions. Consider developing all possible sources of water. This includes developing springs and seeps, installing water tanks, building ponds or reservoirs, and drilling wells. Hauling water short distances to permit harvesting the feed from certain areas may be necessary in some cases, but this should be used as a last resort as it is a costly, time-consuming, and temporary solution.

Supplemental Feeding

Supplemental feeding is normally practiced to maintain herd performance in reproductive rates and weaning weights. During drought additional supplemental feed is provided to replace lost forage production. Supplemental feeds provide additional protein and energy to cattle. 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 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 the grains such as barley, corn, milo, and wheat. Molasses is an excellent energy source and in addition acts as a binder to keep down dust in ground and pelleted mixes. It is also used to increase palatability of feed mixes.

Liquid supplements can be formulated to provide either protein or energy. These liquids are commonly used when adequate amounts of low quality dry forage are available. Under drought conditions requiring replacement for forage these supplement forms are not recommended unless they are provided along with low quality roughages. Liquid supplements should not be considered if it takes more than 2 pounds per cow per day to maintain desired livestock performance.

As animals are exposed to severe drought conditions for some time, their maintenance requirement will decrease and a lower feed level will be adequate (Table 1). Gradual reduction of feed levels is important as it will allow animals to adjust to the lower level with little pronounced effect. However, weak animals should not be allowed to decline in condition and become weaker because greater quantities of feed are then required to bring them back to good condition.

Feeding the standard daily requirements twice a week is more effective than daily feeding of reduced amounts. These less frequent large feedings allow the weaker animals, as well as the stronger animals, to get their fill. This will also save on labor costs.

Table 1. Submaintenance Diets – Daily Quantities for Various Classes of Cattle

Feed	Calves 6-12 months	Yearlings 12-18 months	Cows early pregnancy	Cows late pregnancy	Dry cows over 18 months
	(lb. per day)				
Legume hay	6-8	6-8	8-10	16-18	6-8
Grain	4	4	6-8	8-10	4-6
Grain	2-2.5	2-2.5	4.5-6.5	6.5-8.5	2.5-5.5
Legume Hay	1	1	2	2	1
Low quality dry roughage	6	6	12-16	16-20	6-12
Protein meal (41% protein)	1	1	1	1.5	.75
Grain	2-2.5	2-2.5	4.5-6.5	6.5-8.5	2.5-5.5
Low quality dry roughage	1	1	2	2	1
Protein meal (41% protein)	.25-.5	.25-.5	.5	.5	.25-.5

From Dunbar et al. 1987

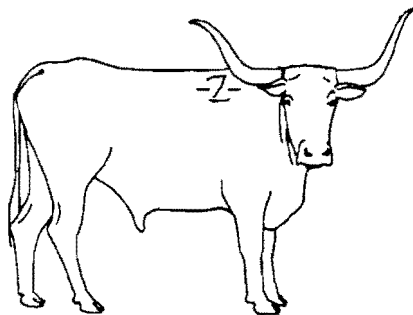
Livestock Management

During normal feeding conditions, animals deposit some of the essential minerals in their bones. During short deficiency periods these minerals are used. Under most dry feed conditions cattle should receive a calcium and phosphorous supplement. During prolonged drought it is 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. Vitamin A can be provided 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. However, 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.

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

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

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



Formulate a selling policy to deal with classes of animals to sell and rate at which they should be placed on the market. Pregnancy check all heifers and cows, cull those that are open, and save the most desirable and younger cows. Carrying these on minimal rations will enable you to save valuable breeding stock and replenish the herd after the drought has broken.

Wean calves as soon as possible. Don't let heifers or cows get into poor condition. Weaning ages can be classified into three groups:

1. 6 months or older
2. 3 to 5 months
3. 6 weeks to 3 months

Calves weaned at 6 months or older perform well on high quality roughage. Calves 3 to 5 months can be raised on good quality hay and grain. Calves 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, to save 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:

1. Calves under 3 months
2. Lactating heifers
3. Calves 3 to 6 months
4. Lactating cows
5. Heifers or cows in the last 3rd of pregnancy
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 stand longer periods of nutritional stress. These animals should be given low 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 classes of animals should receive highest priority and be fed the best feed. Bulls should remain in fair condition except prior to the breeding season when condition needs to be improved.

Watch for buildups of internal and external parasites. Parasites can be a more serious problem on cattle under stress than under normal conditions. A good parasite control program will be even more important during drought. Make sure your cattle have internal parasites before you treat as deworming is expensive in labor and materials.

Assistance Available

The USDA Emergency Feed Program is initiated locally through the County Executive Director of the Agricultural Stabilization and Conservation Service (ASCS) when a substantial loss (greater than 40 percent) of livestock feed occurs. The program provides cost sharing for the purchase of supplemental feed. Information regarding this program is available by contacting your county ASCS office.

In formulating a supplemental feeding program to fit an individual operation, assistance is available from range and livestock professionals in the University of California Cooperative Extension.

Special income tax considerations are available to producers when livestock is sold due to drought. University of California Cooperative Extension specialists can provide educational materials describing various methods of determining your tax responsibility. However, it is always best to consult your accountant or tax advisor concerning the specifics of your case.

References

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Figure 2

