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Planning for drought on Colorado rangeland

E. T. Bartlett, Wayne C. Leininger and L. Roy Roath¹

Quick Facts

- Drought is a natural phenomenon on Colorado's rangeland and occurs approximately once every five years.
- Livestock managers should formulate a plan that can be implemented quickly when drought occurs.
- Stocking rates generally need to be reduced during drought to allow satisfactory animal performance and prevent damage to range plants.

Most Colorado rangelands have arid or semi-arid climates. Ranchers can expect below average rainfall at least half of the time. The Southeastern Colorado Research Center (west of Springfield) reported below normal precipitation for 15 years from 1957 to 1985. During four years the total precipitation was less than 75 percent of normal. Colorado ranchers and range managers should expect drought at least once every five years and develop a drought plan.

Drought is defined as a prolonged period of several months or more of below average soil moisture. A severe drought is when precipitation is more than 25 percent below normal. While drought usually is identified as years of low rainfall, drought also can occur when the seasonal distribution of rainfall is not favorable for plant growth or when temperatures are high.

Plant Growth

In normal years, initial grass growth relies on food reserves stored in the roots and crowns for a relatively short period. By approximately the fourth leaf stage, most grass will begin to restore food reserves for next year's growth. During

drought plants may go dormant before the end of the normal growing season. Thus, plants enter a longer than normal dormant period and become dependent on food reserves earlier in the year. Adequate food reserves also help plants tolerate extreme temperatures that often accompany drought.

Drought increases the rate of natural die-off of plant roots. Range plants that have lost root biomass during drought are less able to obtain nutrients and water from the soil. Thus, drought stricken ranges should be managed to promote root replacement. Because growth is initiated early in spring, deferment from grazing during this period is important for reestablishing vigorous root systems.

Effects on plant growth depend on the severity and duration of the drought as well as the health of the vegetation going into it. Plants that are in low vigor (health) before a drought will suffer more damage than vigorous plants and may die. Even on ranges in good condition, forage production is less than normal during drought. The period of plant growth and high forage quality is reduced.

Although the amount of forage produced during drought is less than normal, the quality of forage may be higher than normal. This is because plants stop growing before maturity. They have a higher than usual number of leaves compared to stems, and structural fiber that reduces digestibility does not form. There also is evidence that the plants cure better in dry years. However, because there is less forage production, ranges cannot be stocked at the same levels as in normal years. If stocking is not adjusted, a stocking rate considered moderate in a normal year will be heavy in the dry year. This may result in overgrazing and damage to plants that requires prolonged time and rest to recover.

¹E. T. Bartlett, Colorado State-University Cooperative Extension range science specialist and professor; Wayne C. Leininger, assistant professor; and L. Roy Roath, Cooperative Extension range specialist and associate professor; range science (6/89)

Rangeland that has been heavily stocked is more severely damaged by drought and requires more time to recover than moderately stocked ranges. Rangelands will not be as likely to suffer damage and recover quicker if stocking rates are reduced to capacity during drought. Drought effects in one year will continue into spring and summer of the next. Reduced residual forage at turnout in spring is a carry-over effect. Spring growth will likely be delayed and the growth rate will be slower than normal.

Animal Performance

In a moderate drought, animal performance can be maintained if stocking rates are adjusted to the carrying capacity of the range. However, if forage production will not meet animal requirements, performance will suffer. Weaning weights of calves may be reduced by 50 to 100 pounds during severe drought. Yearling gains also suffer if stocking rates are not adjusted. This is due to a short period of high quality, green forage. Supplemental feeding to help maintain animal performance may be appropriate if costs are not too great.

Drought also can have an adverse impact on livestock reproduction. During a drought, there may not be sufficient high quality forage for the cows to cycle within 60 days of calving. This is particularly true of first-calf heifers. Thus, breeding and calving are delayed and their rates possibly reduced next year.

Water

Poor quality water may decrease forage intake and livestock performance. Water shortages necessitate water hauling if a good quality water supply is not available in all pastures. A well-designed pipeline system with a good source of clean water is the easiest method to ensure adequate water. Drought, coupled with hot weather, may cause livestock distribution problems. Livestock may concentrate near water and shade causing local overgrazing and non-use away from water.

Management Options

Ranchers need a combination of alternatives appropriate for their situation before a drought occurs. But remember, in most drought situations, reduction in grazing pressure on the range forage is necessary to allow the range to recover in a relatively short time.

Flexibility. The more management options, the greater the ability to manage through a drought. This applies to animal and range management. If there are several livestock enterprises, such as cow-calf and stocker, the latter can be reduced to stay within carrying capacity without drastically reducing the base breeding herd.

Grazing systems can be designed to maintain a forage reserve for drought. Any grazing system is dynamic and must be adjusted for changing conditions to balance animal requirements with forage availability. Most grazing systems are designed to give plants rest from grazing. Because

plants are under stress during drought, they need a longer period of rest to recover from grazing. In a rotation system, increase the number of pastures within a system or increase the time animals stay in a single pasture to facilitate longer periods of rest. Even with the most sophisticated system, reductions in the number of animals may be necessary to prevent overgrazing during drought.

Ranchers should investigate the feasibility of feeding crop aftermath or by-products during drought. These may provide good quality forage and reduce grazing pressure on range plants. Compare the cost of alternative forages or supplements. Confinement of livestock during drought can relieve stress on plants and improve forage production. During drought years, a combination of confinement of cows in spring and early weaning could be economically feasible.

Animal management. Several options may decrease economic losses in drought. In a cow-calf enterprise, wean and sell calves early. Cull cows with low performance records. Check for pregnancy and cull open ones early. In addition, it's possible to cull late-calving cows without seriously affecting production. Reduce the number of replacements held over to maintain cow herd numbers at a level consistent with available range forage. Heavy culling and reducing the number of replacements during drought effects an operation for several years as the cow herd is rebuilt. On the other hand, this can provide the opportunity to introduce a yearling enterprise.

Give bulls a breeding soundness examination. Cull low-fertility bulls to reduce the number that needs to be maintained in the breeding herd and ensure adequate reproduction.

If the range has a history of heavy stocking, the number of animals removed will be greater than a range that has moderate or light stocking. This not only is necessary to prevent serious damage to the range, but also to ensure that livestock condition is maintained.

Cow condition is one of the most important factors in next year's reproductive success. Cows must be in good condition going into the winter. Once winter starts, it's more difficult to feed enough economically to increase condition. Supplement cows with protein, preferably an all-natural protein.

In addition, shortages of carryover forage and slow spring forage growth that follow a drought mean feeding longer in the spring. If the size of the herd is reduced, the costs of spring feeding (as well as fall and winter) are reduced.

Tax Consideration. Forced liquidation of part or all of the herd in drought may dramatically increase an individual's tax liability in that year. It may be more advantageous, from a tax management standpoint, to confinement-feed part or all of the animals that can be sold. However, if a federal drought disaster is declared, special tax considerations may change what is the best option. Producers should consult a competent agricultural tax accountant to help evaluate their situation.