

Recognizing and Responding to Drought on Rangelands

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Recognizing drought is a matter of perspective. To a resident of Iowa, Wyoming is always in a drought. For Laramie, receiving 12 inches of precipitation is a good year, especially if 25 percent comes in spring – the best time.

There has been a tendency to confuse water supply drought with forage production drought. Irrigators and municipalities are concerned about low winter snow amounts in mountain watersheds that supply reservoirs and streams for direct flow withdrawals; however, the plains rancher is affected much more by low spring rainfall or snowfall.

Spring precipitation is the primary influence on forage production. Recurring years of low snowfall shriveling springs and streams that provide drinking water is a concern for ranchers and wildlife managers. The need for more reliable sources of water becomes more evident in drought.

Relatively small departures from “normal” might be noticed in an area that usually receives low precipitation. Unfortunately, the better years are often remembered as normal. The reality is half or more years are below average.

Using Saratoga, Thermopolis, and Worland to represent a cross section of precipitation zones, 63 percent, 52 percent, and 48 percent of the years, respectively, were below normal. Normal – what we expect to see in most years – is likely to be below average.

Drought in Wyoming may always seem severe but, compared to areas where the precipitation is driven by isolated convective storms, the state seldom fails to receive some precipitation in a particular location. Regional storms provide the most effective precipitation with relatively widespread moisture compared to isolated rainfall from thunderstorms.

For the three locations above, the respective departures from average annual precipitation that characterize the worst drought years are 53, 59, and 49 percent. Seasonal departures from average may be more severe. As little as 15 percent of average April precipitation was recorded at Saratoga in 2002. Similar departures from average spring precipitation were noted in 2006. These severe departures from average seldom occurred over the last several decades, and the frequency of multiyear droughts is relatively low.

The three locations above have had, respectively, five, two, and three periods of below-average precipitation lasting three years over the last 40 years. The lowest forage yield year in the last 19 at Saratoga still had about 50 percent of average forage production.

Probability predictions of above- or below-average precipitation are available at <http://www.cpc.ncep.noaa.gov/products/predictions/90day/lead01/index.html>. Local information is usually available to allow growing season predictions. The Bureau of Reclamation, in conjunction with Natural Resources Conservation Service, provides snowpack levels and expected availability of irrigation water.



Spring moisture has the greatest affect on rangeland forage. Fall and winter precipitation has little relationship with the growing season's forage production.

Successfully predicting the effects varies with elevation and plant community types. At Saratoga – slightly over 7,000 feet in elevation and with a plant community almost exclusively of cool-season grasses – mid- to late-April precipitation provides a good prediction for peak summer forage.

The forage availability prediction window opens early- to mid-March for lower elevations and was longer, extending to late May-early June. They were also less precise in predicting forage yields. Forage prediction differences between higher and lower elevation locations in predicting forage yields are due to earlier thawing of soil, earlier greening of vegetation, and more warm-season grasses at lower elevations.

Generally, the proportion of precipitation peaks in May and drops for each succeeding month. The probability of receiving sufficient precipitation in May or later to overcome low precipitation in early spring is relatively low, suggesting that deciding what summer forage/cattle management strategy to implement should be made by the end of April. Precipitation after May has little impact on forage yields.

The amount above or below average precipitation indicates whether the producer should plan on maintaining, decreasing, or increasing stocking levels.

A number of management practices may help lessen the effects of drought. Rangeland plants in Wyoming show little long-term effects of periodic drought. Managing use levels or residual forage amounts in a pasture during the critical growing period of cool-season grasses (early boot to soft dough stage) and subsequent deferment the same time next year can maintain long-term plant health.

Pastures grazed outside the critical period need to have residual forage that provide adequate amounts for grazing animals and soil surface protection. Simple, rotational-

deferred grazing systems or short-duration grazing systems that do not graze the same pasture at the same time every year provide adequate management.

Deferring grazing solely for drought recovery is not warranted if the grazing program provides periodic deferment during the critical growing period.

Providing an adequate amount of well-distributed water for livestock is a major concern, drought or not. Often, adequate forage is available in dry years if additional water can be provided to livestock to ensure stock can get to the forage and not over-use areas closer to remaining water sources.

Using low-stress livestock handling techniques while herding can be effective in getting animals beyond their normal daily travel range – but is an every-day job. Hauling water ensures cattle are at a desired location to get the forage resource – and no additional herding is required.

On summer pastures, surface pipelines can effectively provide drinking water and can help move animals by controlling their access to water.

Modifying a ranch management system is effective in reducing the risk of the next drought. No rancher wants to sell breeding stock. Having a portion of the ranch herd, such as retained yearlings, that can be sold earlier than normal and to be used in response to impending forage shortage, can be an advantage. Herd management practices such as later calving shift the cow's nutrient needs so grazing in winter is more feasible and reduces reliance on irrigated harvested forage. Early weaning and selling or backgrounding calves can reduce forage needs.

Cattle most likely to be culled can be identified if drought is expected. Sale should be early before prices decline and additional forage is used.

Drought unquestionably reduces the harvestable production on a ranch, but drought can be anticipated. Water facilities, a flexible management system, and planning timely actions will minimize drought's impact and provide opportunities to take advantage of better times. A Web product related to drought for Wyoming is <http://www.wrds.uwyo.edu/images/wrds/nrcs/snowmap/snowmap.gif>