Drought in New Mexico: Prospects and Management

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Drought and low cattle prices have long occurred together in New Mexico. They have always been the nemesis of both rangelands and ranchers. Past periods when severe, extended drought conditions prevailed include the 1860s, 1890s, 1930s, 1950s, and 1970s. The long intervals between droughts allows lessons from the past to be overlooked or forgotten at the very time when they are most useful.

It has been my experience that range management is more a game of managing climatic and financial risks rather than of maximizing forage production and harvest efficiency through aggressive of practices such as seeding, brush control, fertilization or intensive fencing and water development (Holechek 1996). Studies by Lantow and Flory (1940), Reynolds (1954), Boykin et al. (1962), and Shoop and McIlvain (1971) all demonstrate that drought planning is the critical element of ranching survival in the southwestern USA.

Drought has now plagued New Mexico rangelands for the third straight year. This year (1996) it was generalized across the whole state, until late June, while in 1994 and 1995 it occurred primarily in the southern half of the state. Most of the state did receive normal or above precipitation during July through September of 1996 To make matters worse cattle prices are down 35% from the 1992–1993 peak and grain costs (corn and wheat) are nearly double those of 1995.

Many ranchers face the dilemma of whether to restock, or to hold present livestock under hopes of rainfall and higher cattle prices next year. All this raises the questions of what are the prospects for precipitation, higher cattle prices, and lower supplemental feed prices going forward. Another question I will address is what management strategies have worked best for New Mexico ranchers in past droughts.

Climate Factors

An examination of climatic records shows that severe extended droughts lasting 4 to 6 years occur about every 40 years in New Mexico. The drought of the 1950's lasted 6 years (1951–1956) with 1956 the driest year in the eastern part of the state. Ten year periods with well above average precipitation have been followed by 10 years when drought prevailed. Because the 1984-1993 period was extremely wet (27% above average precipitation across the state) and extended droughts (4–6 years) appear to occur at intervals of about 40 years, the prospect of greatly improved precipitation conditions does not seem particularly good for the next few years.

Climatologists relate the present drought forecast to the "La Nina–El Nino cycle". This is a 22 year cycle characterized by 11 wet years (El Nino) and 11 dry years (La Nina) that affects the Central Great Plains and southwestern USA. Basically the explanation centers around spots on the sun that change their polarity every 11 years. This in turn causes a cooling in the South American Pacific Ocean, which results in high pressure systems that deflect air flows from the Gulf of Mexico. The bottom line is that at 20–24 year intervals these forces have brought drought to Arizona, New Mexico, and west Texas.

Presently climatic forecasts project relatively dry conditions for 1997 and 1998 in the Central Great Plains and southwestern USA. Whether this means a complete lack of rain or just below average precipitation is uncertain.

Cost Containment Strategies

In terms of cattle prices, there could be some improvement starting in fall 1996 based on Cattle Fax reports. Generally down trends in cattle prices last 3–5 years with upturns occurring after enough liquidation has occurred of the nation's beef herd to relieve the oversupply problem. There was substantial liquidation of cow herds in Texas, New Mexico, and Arizona during the spring of 1996.

Regarding harvested feed cost, most forecasts indicate no major changes in hay or corn prices. However there is uncertainty here since climatic conditions across the USA will drive harvested feed prices as well as cattle prices.

Another critical aspect of the drought problem involves forage production. Even with above average rainfall and good grazing management, forage production has been only about half the 10 year average in the first year after extended drought based on several studies in New Mexico and other western states (Herbel et al. 1972). This is because of death loss and weakness in primary forage grasses. About 5 to 7 years are required for full rangeland recovery from severe drought. Rangelands grazed conservatively or moderately produce more forage during drought than those heavily grazed (Klipple and Costello 1960, Paulsen and Ares 1962). Their recovery is also much more rapid after drought. Ranchers are cautioned not to increase stocking rates too soon before recovery from drought has started.
If drought persists through the summer of 1997 or 1998, it is probable that severe mortality will occur in primary forage plants such as black grama in the southern part of New Mexico (Herbel et al. 1972). This could reduce long term grazing capacity to 50–60% of pre-drought levels in the post-drought period. Ranchers need to be prepared for this possibility.

The Political Position

The USDA-Emergency Feed Program warrants discussion. This government program has provided ranchers with 50% of the range forage deficit in cash reimbursements or harvested feed during drought (Holechek and Hess 1995). It was discontinued by congress as of May 31, 1996. However New Mexico congressmen were planning to introduce legislation to bring it back for one year. These plans have been put on hold due to rainfall this summer, and economic evaluations we have sent them. My economic analyses for southwestern New Mexico show that ranchers who have held most of their livestock and used the Emergency Feed Program since summer, 1994 would have severely accentuated their financial losses, compared to ranchers who quickly destocked their rangeland in accordance with range forage and did not use purchased feed.

Estimations of harvested feed costs for maintaining livestock during the drought will vary with location and type of operation. However, based on $125 per ton hay and $270 per ton cottonseed meal cubes, the cost per cow per day is $1.25 with 75% supplementation (Davis 1996). That would be about 17.4 pounds of hay and 1.2 pounds of cottonseed meal cubes per cow per day. On this basis it would cost about $9,375 per month to maintain a 250 animal unit herd with 25% reliance on range forage. With full feeding the cost would go to about $12,500 per month. Use of the USDA Emergency Feed Program the cost would be reduced to about $4,500–$6,500 per herd per month or $20–25 per animal unit per month. Even with the USDA-Emergency Feed Program, the costs of maintaining livestock with harvested feed for more than a few months quickly become overwhelming.

Strategies for Survival

Basically the best strategy for New Mexico Ranchers in this and the 1950’s drought (Boykin et al. 1962) would have been to reduce the breeding herd by 35-50% when drought became apparent. This is because forage production has typically been reduced 50–75% during drought compared to pre-drought periods (Herbel et al. 1972, Pieper et al. 1991). Reducing livestock in accordance with forage availability rather than holding livestock and providing them harvested feeds has been the best drought strategy financially and biologically because harvested feed costs have increased and cattle prices have declined as drought increased in severity (Boykin et al. 1962). The more ranchers invest in purchased feed and the lower livestock prices become, the more reluctance there is to sell livestock. This has often resulted in severe rangeland degradation and in some cases death of livestock when the rancher ran out of money to purchase additional feed but did not want to sell livestock at give away prices. Ranchers who maintain livestock on harvested feed should confine them to avoid damage to the range. Herbel et al. (1984) provides a good evaluation of confinement strategies for livestock during drought in New Mexico.

Some ranchers in New Mexico have held livestock on pastures where forage is depleted without supplementation in hopes of rainfall. They need to keep in mind that once animals lose 15–25% of normal body weight their recovery will be slow and costly (Young and Scrimshaw 1971, Holechek et al. 1995). Animals losing 30% or more of normal body weight will nearly always die (de Calesta et al. 1975). Ranchers who allow their livestock to get into poor condition may find it difficult to sell them at any price. In both Texas and New Mexico mature cows sold for as little as $10-13/CWT in spring, 1996. Excessive weight loss by livestock should be avoided by either selling them or providing them with maintenance feed.

Herd composition can play a critical factor in managing drought risk. Ranchers who maintained the breeding herd at 50% of grazing capacity in the pre-drought period would have done much better financially than those who tried to maintain it near capacity during the 1950’s drought (Boykin et al. 1962). Increased calf carry over, and purchase of yearlings, during years of average or above-average rainfall and complete sale of calves and cull cows during severe drought was the most profitable way to adjust to fluctuating forage resources.

One common thread that binds the various drought management papers together is the advocacy of conservative stocking before, during, and after drought (Lantow and Flory 1940, Reynolds 1954, Klipple and Costello 1960, Boykin et al. 1962, Paulsen and Ares 1962). From both vegetation and financial standpoints, this appears to be the key to drought survival. Boykin et al. (1962) evaluated survivors of the 1950’s drought from the standpoint of their ranch management practices. The four ranchers studied firmly believed that conservative stocking was the critical element in their survival. The success of the “Grass Bank” ranchers in southwestern New Mexico during the present drought tends to confirm the importance of maintaining a forage reserve, or being understocked as some would call it.

Conservative stocking involves 30–40% use of the current year standing crop of the primary forage species (Klipple and Costello 1960, Paulsen and Ares 1962) (Figure 1). In arid and semi-arid areas there appears to be little advantage to heavier use levels in terms of higher net financial returns or lighter use levels in terms of increasing range condition and forage production or reducing financial risk. Forage plants on conservatively or lightly stocked ranges actually seem to do better during and after drought than those on areas with no grazing (Paulsen and Ares 1962, Ganskopp and Bedell, 1981). In drought, residue or stubble may be a more appropriate criterion than utilization
standards if new growth is minimal. Grazing should be dis-
continued if average plant heights fall below 2 inches on
short grasses, such as blue grama or 4–6 inches on mid-
grasses such as sand dropseed. These same height guide-
lines apply to initiation of grazing on new growth after rain-
fall has occurred.

I believe range managers, particularly those on public
lands, should be oriented towards preventing natural
resource degradation, and minimizing producer economic
risk rather maximizing forage harvest efficiency by live-
stock. I hold the opinion that continuation of livestock grazi-
ing on public lands will depend heavily on ranchers demon-
strating good stewardship. Based on history the success of
range management strategies is much more determined by
the drought years when times are hard, rather by a run of
wet years when high livestock prices prevail.

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