Grazing Management after Fire and Drought

Texas AgriLIFE Research-Sonora
Charles “Butch” Taylor
angora@sonoratx.net
1. **Fire, drought, and grazing** are linked and promote heterogeneity on rangelands.

2. Heterogeneity on rangelands can lead to simultaneous:
   - Increases in biological diversity
   - Maintenance of livestock/wildlife production
   - Sustained ecological processes
   - If, grazing management is proper
Ecosystem Function

- Fire
- Grazing
- Drought
60-years of no grazing/browsing or prescribed fire
Effects of Cedar on Rangeland Products

- Livestock & Wildlife Production
- Volatile Fuels
- H2O Availability

Yield

Grassland  Savanna  Woodland  Cedar Break
Fire Frequency

- > 6-years
- < 6-years

Adapted from Frost 1998
Lightning strikes and cumulative forage growth

Lightning strikes

Cumulative forage growth
A major portion of Texas is a semi-arid region. In a desert, one knows what to expect of the climate and plan accordingly. The same is true of the humid regions. Men have been badly fooled by the semi-arid regions because they are sometimes humid, sometimes desert, and sometimes a cross between the two.
Palmer Drought Severity Index values for the years 1949 to 1959 & 1992 to 2002 for the Texas AgriLIFE Research Station-Sonora.

PDSI measures the accumulated effect of deficit or surplus rainfall relative to the rainfall needed to maintain adequate soil water content for normal (water stress free) growth of plants (Palmer 1965, PDSI 2003).

4 and above = extreme moist period.
3 to 3.9 = very moist period.
2 to 2.9 = unusual moist period.
1 to 1.9 = moist period.
.5 to .9 = incipient moist period.
.4 to -.4 = near normal.
-.5 to -.9 = incipient drought.
-1 to -1.9 = mild drought.
-2 to -2.9 = moderate drought.
-3 to -3.9 = severe drought.
-4 and below = extreme drought

Drought – Is an insidious hazard (risk) of ranching.
“The Time It Never Rained”

Elmer Kelton

“Each new generation tends to forget – until it confronts the sobering reality – that dryness has always been the normal condition in the western half of the state. Wet years have been the exceptions.”
Decreases in individual basal area per plant can increase the susceptibility of a plant community to the impacts of drought.
Proper Grazing Management

1. Stocking rate has to be flexible (balance forage supply with forage demand)

2. Managing for a mixture of kinds and classes of livestock & wildlife offers more flexibility and marketing opportunities.

3. Implement a monitoring system for grazing/browsing use on vegetation and an estimate of forage production.

4. Use “Grazing Manager software” to make adjustments in stocking rate
Erosion: Assumes a Tarrant soil with an average 8% slope in C factor zone 35B.
Nitrogen loss: Assumes 3g of nitrogen per 1kg of soil.
Fire = {prescribed fire}; {wild fire}; {controlled fire}

Does wildfire affect vegetation differently than prescribed fire?

NO, It’s the management following fire.
Since 1996, there have been five winters in which La Niña conditions were present: 1996, 1999, 2000, 2001, and 2006. In three of them, Texas has experienced severe fire seasons; 1996, 2000, and 2006.”  

Source: Texas Forest Service (October, 2007)
Cattle spend 75% of their grazing time in patches burned during the past year .................................................................Fuhlendorf & Engle 2004

Cattle prefer areas altered by fire for up to 2-years post fire compared to unburned areas.................................................Williams et al. 1980

Plants, both herbaceous or woody, increase in nutritional quality following fire (Dills 1970, Rogers 2004, Wood 1988).

“They (the indians) habitually burned off the grass in the spring and fall preceding the rains to keep down the underbrush, to provide green grazing for game and their ponies and to improve hunting”............................Youngblood 1921
Time spent foraging (%) by white-tailed deer in summer and winter burned patches and control (no burning) on the Sonora Station (data were collected from August 29, 2006 thru November 2, 2006).

Winter burns were conducted in January, 2006 - Summer burns were conducted in July, 2006

More forbs and browse available in summer burned treatments compared to control and winter burns.

Deer spent time in control treatments foraging for pear apples which were not present in summer or winter burn treatments.
Education and training is the Key
Academy for Ranch Management
2 ½-day workshops on Prescribed fire
http://www.ranchmanagement.org

Burn Schools
February 19, 20, & 21
March 5, 6, & 7
Burned under moderate conditions (i.e., winter burn). Livestock are used to maintain low fuel load.

Burned in hot, dry summer time for maximum effect on juniper and prickly pear.
Planned Prescribed fire during summer of 2008

Prescribed fire March 7, 2008
R.H. ≤20%; Temp ≥100; W.D. = S-SE; W.S. > 6mph ≤20 mph; 1-hr time lag fuel moisture <6%
Factors Affecting Fire Intensity

- Temperature
- Relative Humidity
- Front/Dry line
- Dew Point
- Grazing Management
- Fuel Load and type
- Cloud Cover
- Dead fuel moisture
- Wind
- Slope
- Live/Dead Fuel Mix
- Head Fire
- Back Fire
- Flank Fire
- Strip head fire

Drought