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# Managing Rangelands during Drought

Casey Spackman

Extension Range Management Specialist

Water = Forage = Grazing

<u>Simple Management Answer</u>:

1) Reduce Stocking Number
2) Pray for water

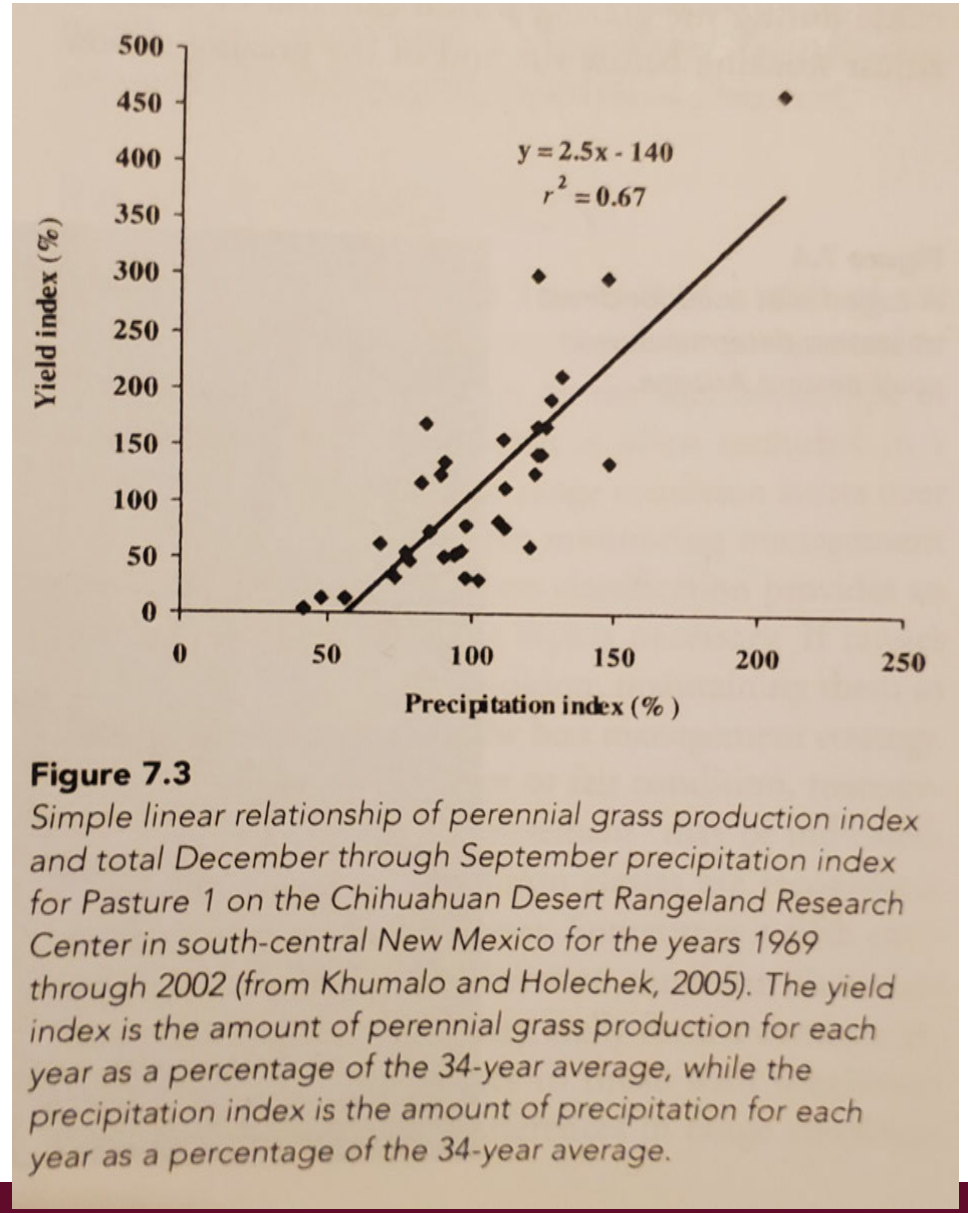
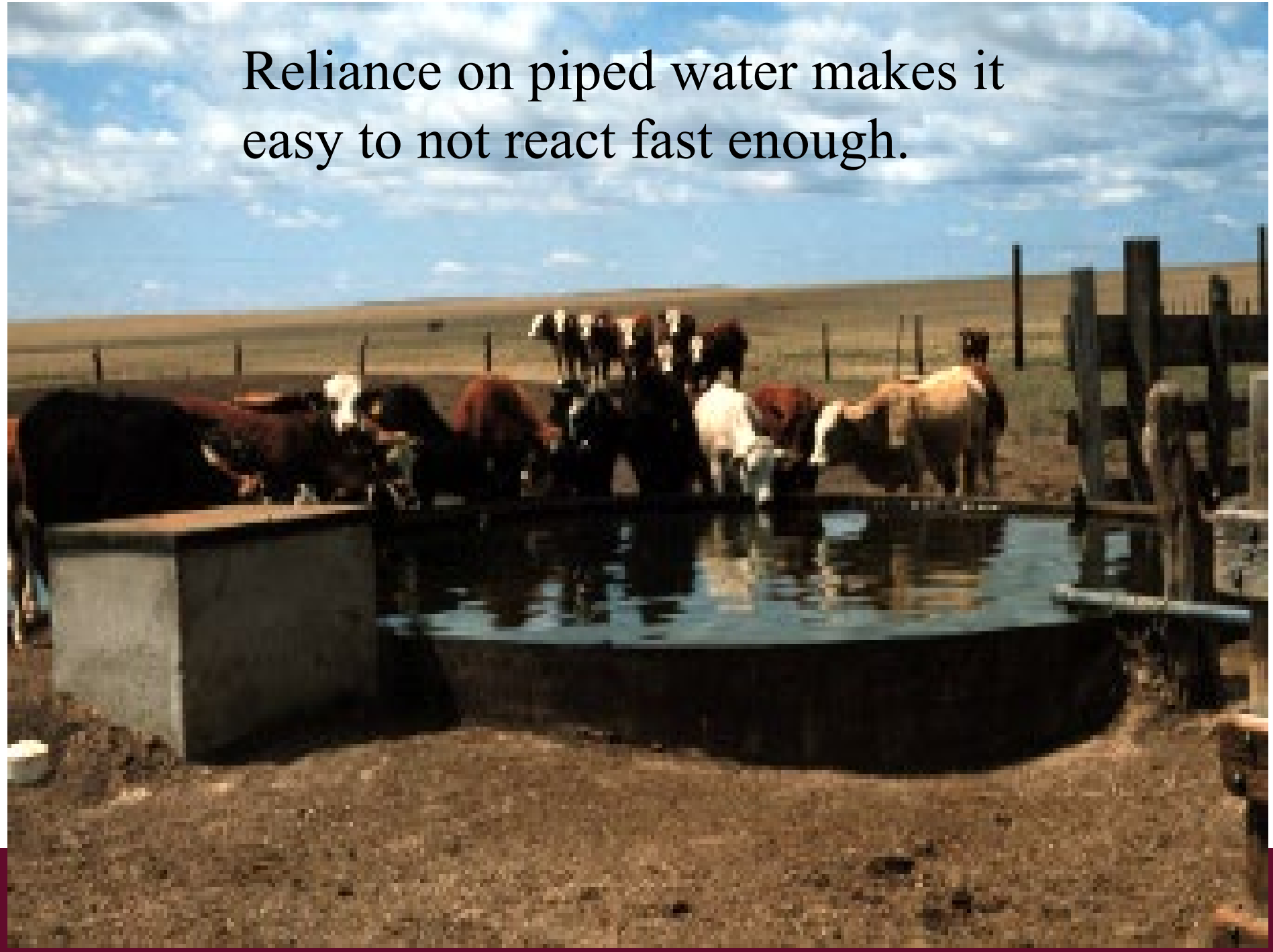



**Figure 7.3**
*Simple linear relationship of perennial grass production index and total December through September precipitation index for Pasture 1 on the Chihuahuan Desert Rangeland Research Center in south-central New Mexico for the years 1969 through 2002 (from Khumalo and Holechek, 2005). The yield index is the amount of perennial grass production for each year as a percentage of the 34-year average, while the precipitation index is the amount of precipitation for each year as a percentage of the 34-year average.*

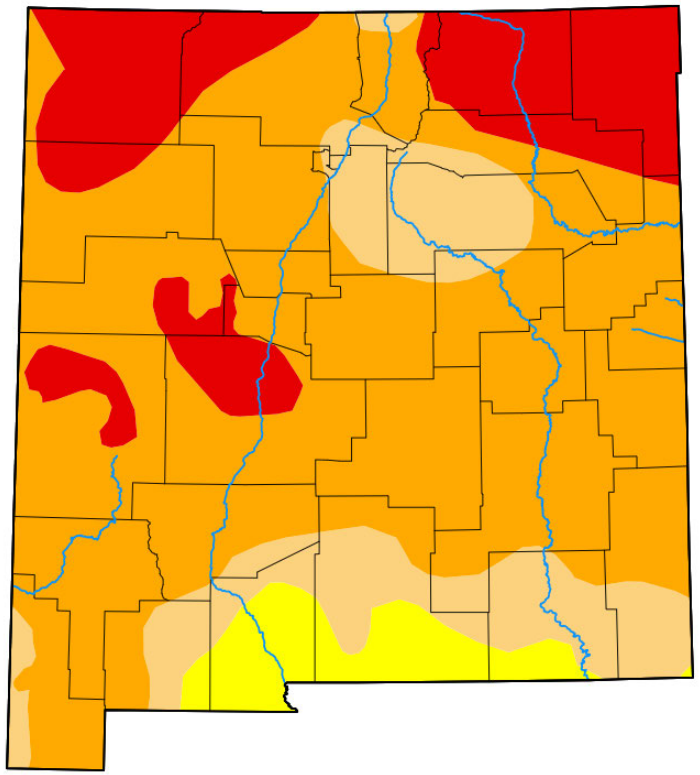
Reliance on piped water makes it easy to not react fast enough.



# How do you know you are in a drought?



# Measurable Indicators of Drought



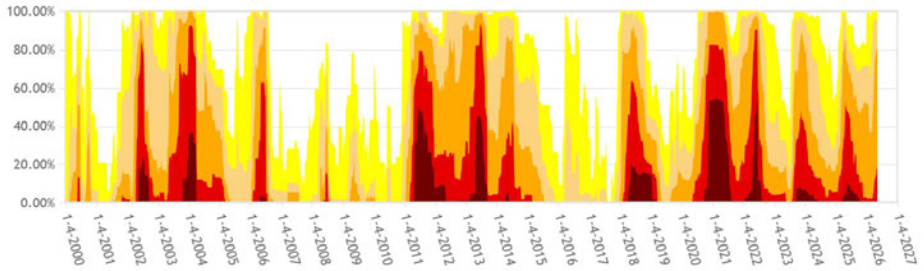
**Map released: Thurs. May 14, 2026**

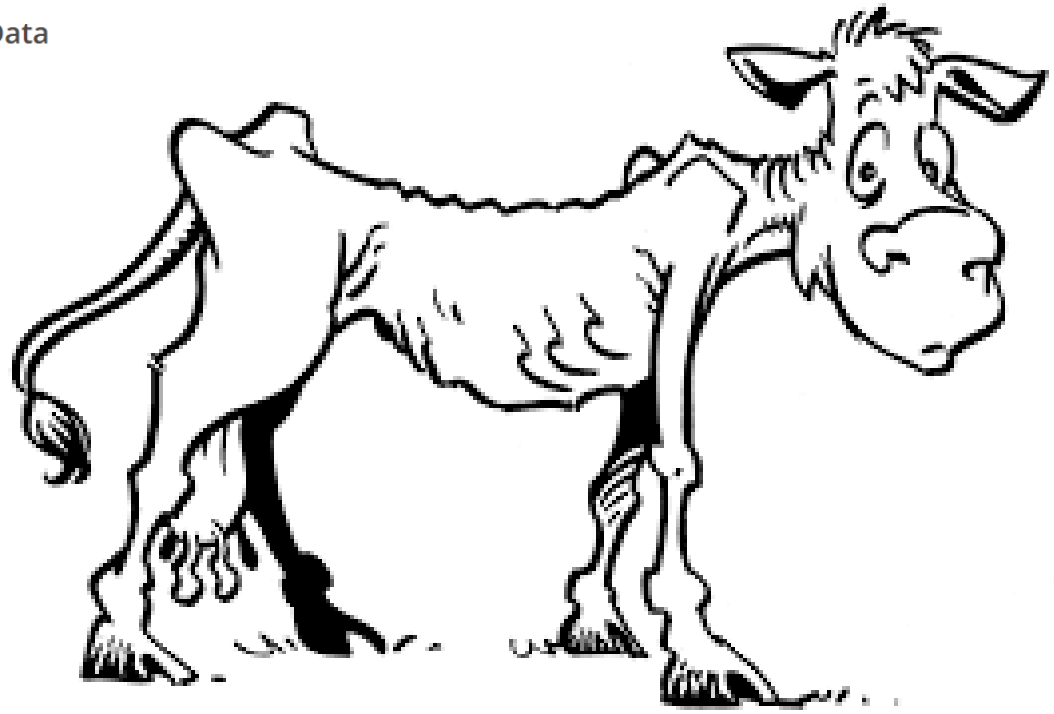
Data valid: May 12, 2026 at 8 a.m. EDT

## Intensity

- None
- **D0** (Abnormally Dry)
- **D1** (Moderate Drought)
- **D2** (Severe Drought)
- **D3** (Extreme Drought)
- **D4** (Exceptional Drought)
- No Data





# Drought Fast Facts

-forage production during drought can experience a 7-fold decline (that is without grazing).

-High mortality to range grasses during drought

-ungrazed 50%

-grazed >50%



# Drought Fast Facts

-low to moderate grazing in arid systems:

***1 year drought = 2 years †recovery**

-high to severe grazing in arid systems:

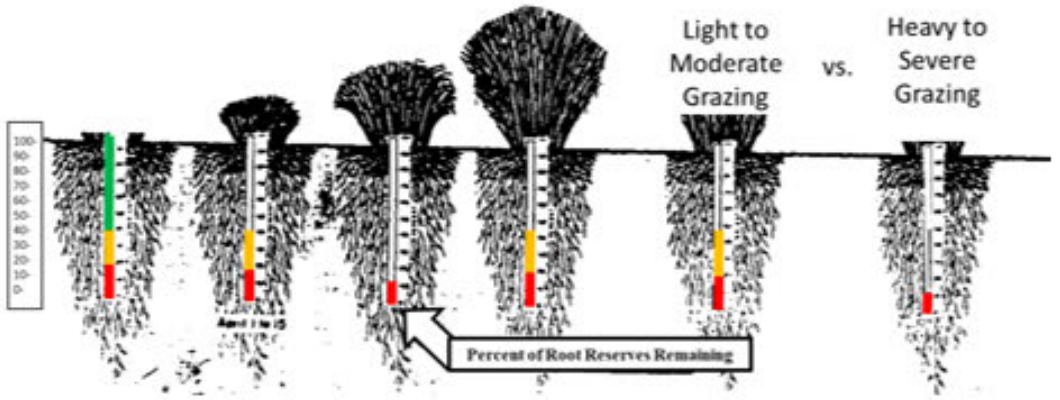
***1 year drought = †5+ to NO recovery**



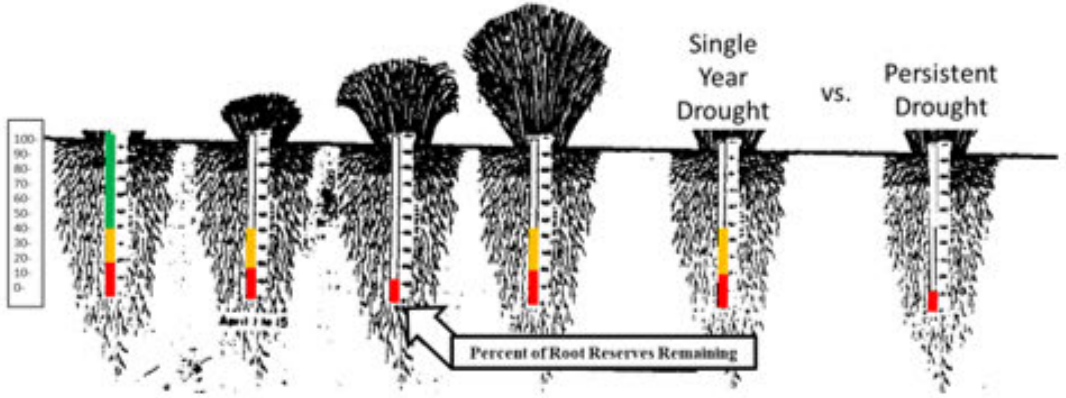
*with normal annual precipitation

†production levels prior to drought

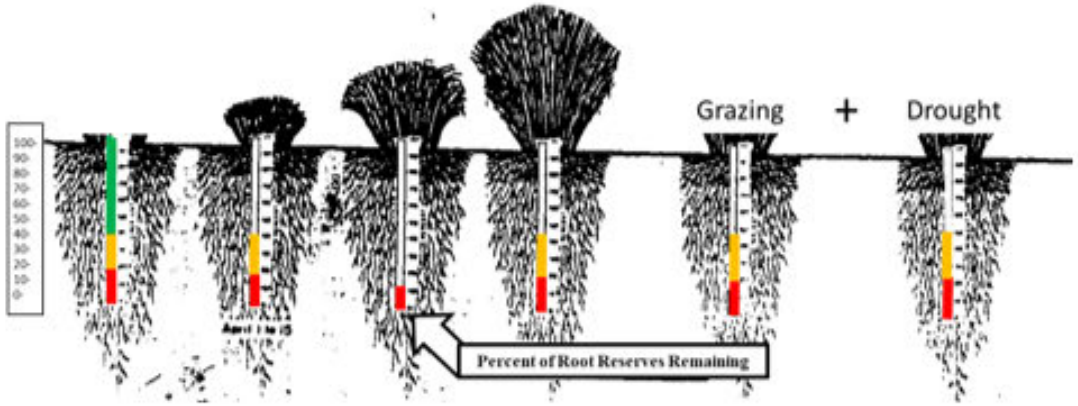
Grazing Effect




Drought Effect

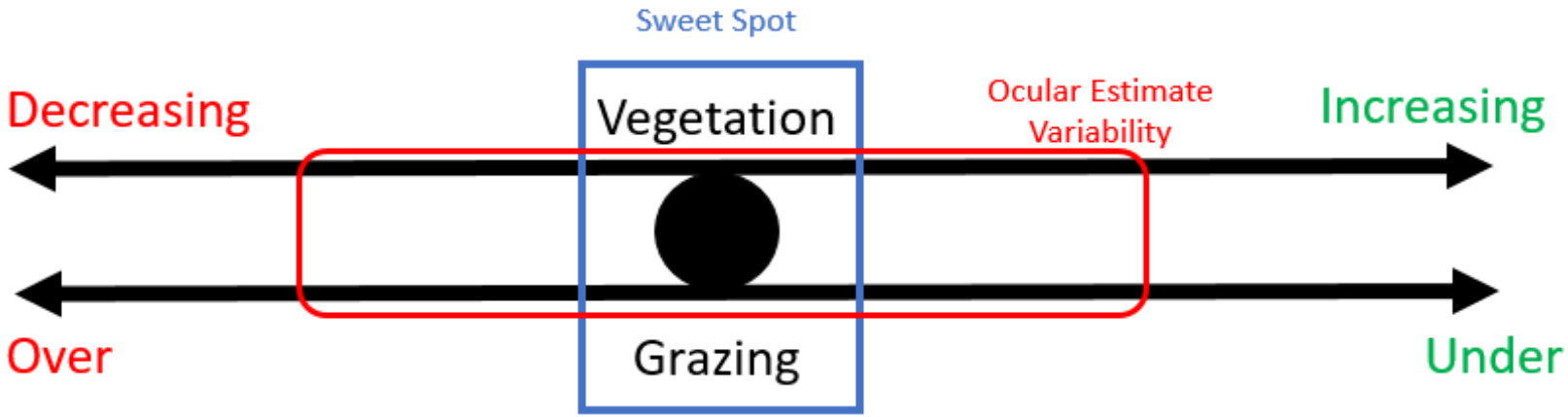



Compounding Effect




Adapted from SCS, USDA

# 2 - The Vegetation-Grazing Relationship




**<u>THE PRODUCER KNOWS HIS LANDS THE BEST!!!!</u>**

**But collecting quantitative information will help alleviate any question or stress of whether vegetation is being over or under used.**

# How are you managing the land during drought?



NMSU photo by Nick Ashcroft

# Strategies for Managing Rangelands

- Monitoring
  - Precipitation/Temps
  - Production
- TIDD
- Others

# Monitoring Precipitation/Temp

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Weather and Climate

https://weather.nmsu.edu/ziamet



# Monitoring Precipitation/Temp




https://prism.oregonstate.edu/explorer/

# Monitoring Production

SCAN ME

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## Annotated Instructions for Rangeland Monitoring Using the Rapid Assessment Methodology

Casey N. Spackman, Samuel T. Smallidge, Douglas S. Cram, and Marcy A. Ward[1]

Agricultural Experiment Station • Cooperative Extension Service • RITF-88

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### INTRODUCTION

Rangeland monitoring in the Southwest is critical for assessing ranch- and pasture-level conditions and making management decisions. A variety of methods exists to collect rangeland monitoring data, but many are complex and labor-intensive. In 2007, the Range Improvement Task Force (RITF) developed the Rapid Assessment Methodology (RAM) to simplify and expedite rangeland monitoring. The technique incorporates the scientific method with regard to quantification and repeatability. RAM quantifies surface cover, species composition, stubble height, available forage, and relative animal visitation utilizing a step-point transect. While remote sensing and drone technologies for range monitoring are advancing quickly, there remains a need for simple and efficient rangeland monitoring, and RAM continues to be widely used by private landowners and agency personnel across New Mexico. This annotated document is intended to be used as a quick reference guide, supplementary to the more detailed procedures found in Allison et al. (2007).



*Figure 1.* **Marking the transect starting point with a T-post and recording GPS coordinates.**

### DEFINITIONS

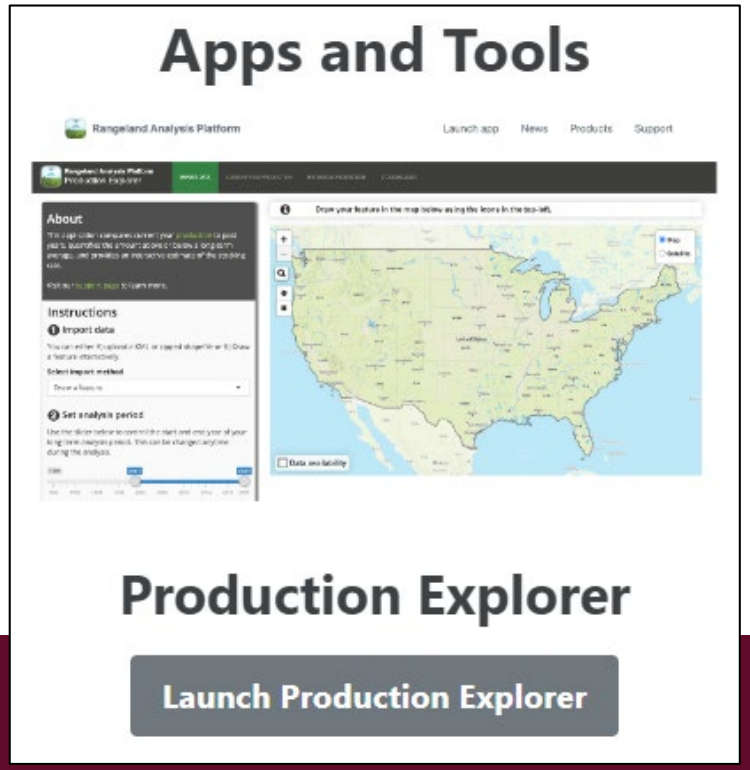
**Exclusion cage**: A structure used to temporarily fence an area within a pasture to prevent livestock and wildlife from foraging in order to assess annual forage production. Cages should be established prior to the start of grazing season, and sampling should occur at the end of the growing season.

[1]Respectively, Extension Range Specialist, Coordinator/Professor/Extension Wildlife Specialist, Extension Forest & Fire Specialist, and Extension Livestock Specialist, Range Improvement Task Force, New Mexico State University.

# Monitoring Production

Rangelands.app



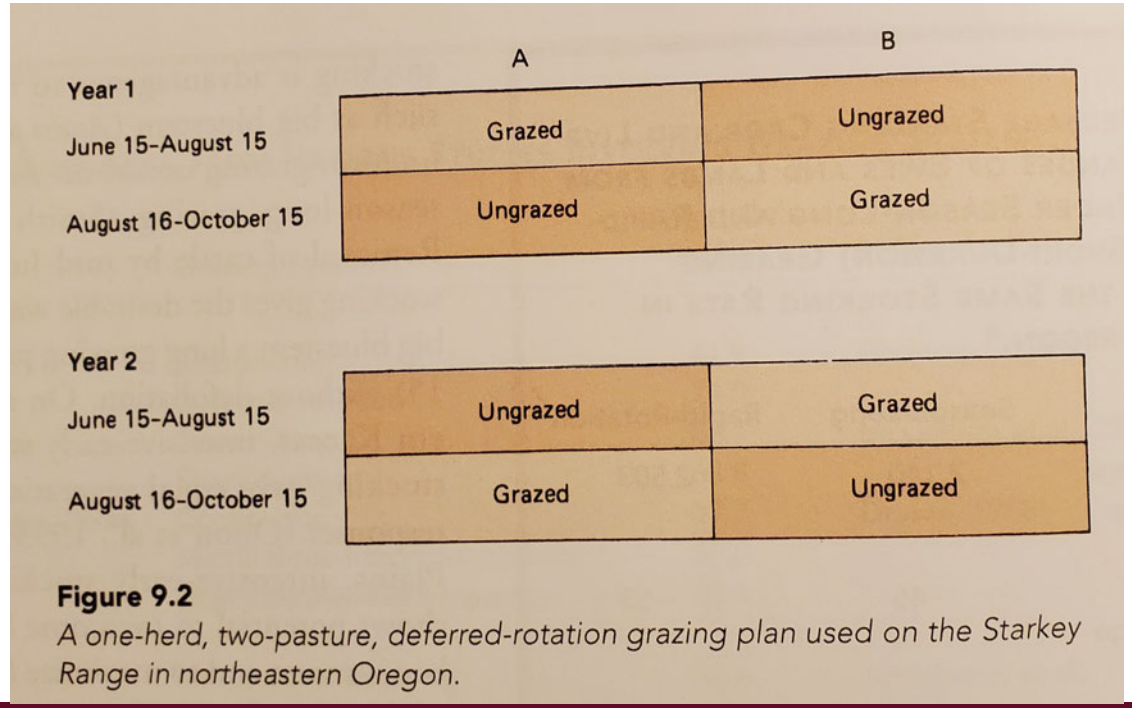
# T I D D

- Timing
- Intensity
- Duration
- Distribution



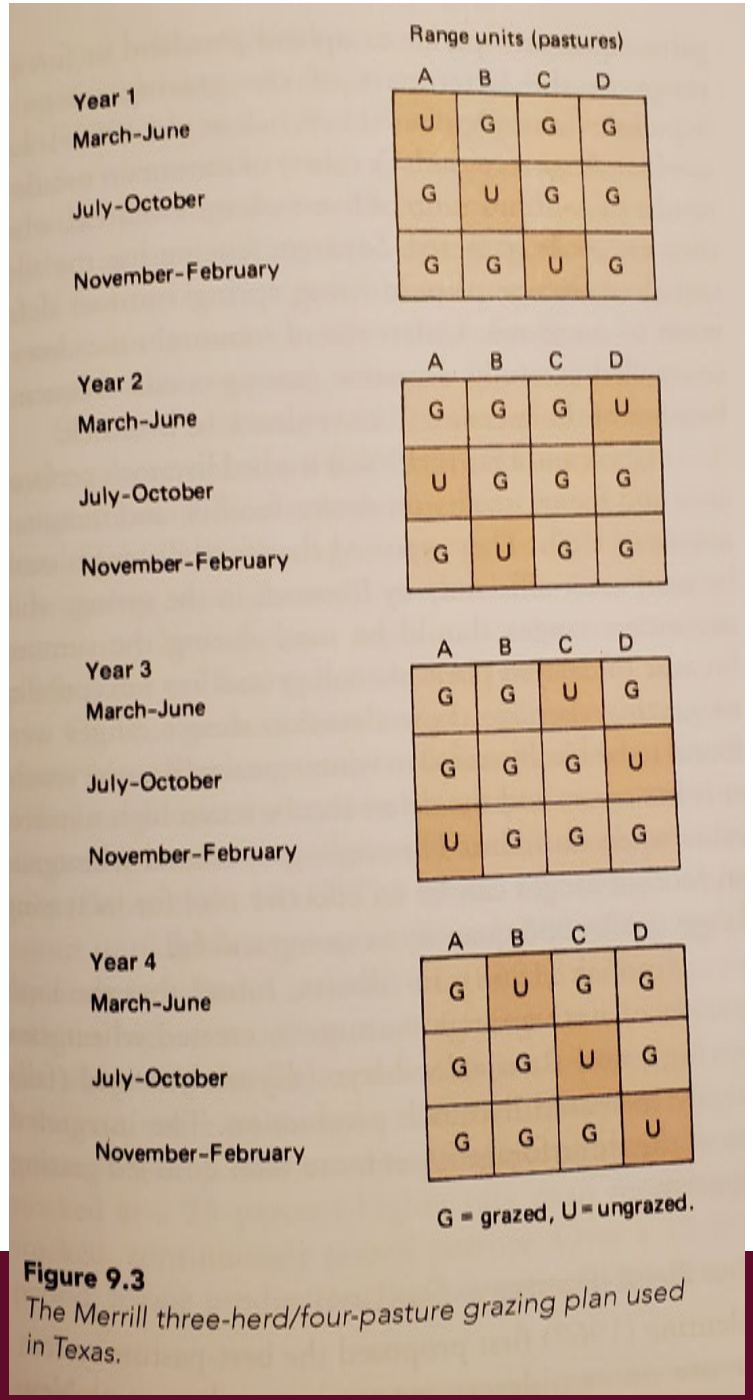
# Timing

- When are you grazing
  - Dormant vs Growing Season vs Rest



| | A | B |
|---|---|---|
| Year 1 | | |
| June 15–August 15 | Grazed | Ungrazed |
| August 16–October 15 | Ungrazed | Grazed |
| Year 2 | | |
| June 15–August 15 | Ungrazed | Grazed |
| August 16–October 15 | Grazed | Ungrazed |

**Figure 9.2**
*A one-herd, two-pasture, deferred-rotation grazing plan used on the Starkey Range in northeastern Oregon.*



| | Range units (pastures) A | B | C | D |
|---|---|---|---|---|
| Year 1 | | | | |
| March–June | U | G | G | G |
| July–October | G | U | G | G |
| November–February | G | G | U | G |
| Year 2 | | | | |
| March–June | G | G | G | U |
| July–October | U | G | G | G |
| November–February | G | U | G | G |
| Year 3 | | | | |
| March–June | G | G | U | G |
| July–October | G | G | G | U |
| November–February | U | G | G | G |
| Year 4 | | | | |
| March–June | G | U | G | G |
| July–October | G | G | U | G |
| November–February | G | G | G | U |

G = grazed, U = ungrazed.

**Figure 9.3**
*The Merrill three-herd/four-pasture grazing plan used in Texas.*

# Intensity

- How much of the forage is consumed or assigned for animal type
  - What is your targeted use?
  - NM < 40%
  - Account for trampling (10-15%)
  - Better to understock than overstock

**Table 8.2**
**DESCRIPTION OF GRAZING INTENSITY CATEGORIES.**

| Qualitative Grazing Intensity Category | Use of Forage by Weight (Percentage) | Qualitative Indicators of Grazing Intensity |
|---|---|---|
| Light to nonuse | 0–30 | Only choice plants and areas show use. There is no use of poor forage plants. |
| Conservative | 31–40 | Choice forage plants have abundant seed stalks. Areas more than 1 mile from water show little use. About one-third to one-half primary forage plants show grazing on key areas. |
| Moderate | 41–50 | Most of accessible range shows use. Key areas show patchy appearance with one-half to two-thirds of primary forage plants showing use. Grazing is noticeable in zone 1–1.5 miles from water. |
| Heavy | 51–60 | Nearly all primary forage plants show grazing on key areas. Palatable shrubs show hedging. Key areas show a lack of seed stalks. Grazing is noticeable in areas over 1.5 miles from water. |
| Severe | 61+ | Key areas show a clipped or mowed appearance (no stubble height). Shrubs are severely hedged. There is evidence of livestock trailing to forage. Areas over 1.5 miles from water lack stubble height. |

*Source:* Adapted from Holechek and Galt (2000).

# Intensity

- How much of the forage is consumed or assigned for animal type
  - Forage Demand by Animal

**Table 3.** Forage demand of various rangeland animals

| Animal | Animal Weight (lbs) | Daily Dry-Matter Intake (lbs) | Animal Unit Equivalents (AUE) |
|---|---|---|---|
| Cattle (Mature) | 1000 | 20.0 | 1.00 |
| Cattle (Yearling) | 750 | 15.0 | 0.75 |
| Sheep | 150 | 3.0 | 0.15 |
| Goats | 100 | 2.0 | 0.10 |
| Horse | 1200 | 36.0 | 1.80 |
| Donkey | 700 | 21.0 | 1.05 |
| Bison | 1800 | 36.0 | 1.80 |
| Elk | 700 | 14.0 | 0.70 |
| Moose | 1200 | 24.0 | 1.20 |
| Bighorn Sheep | 180 | 3.6 | 0.18 |
| Mule Deer | 150 | 3.0 | 0.15 |
| White-tailed Deer | 100 | 2.0 | 0.10 |
| Pronghorn Antelope | 120 | 2.4 | 0.12 |
| Caribou | 400 | 8.0 | 0.40 |

*Source: Holechek (1988)*

# Distribution

- Where are you grazing
  - Proximity to Water or Water Ways (Riparian)
  - Slope of Topography
  - Vegetation Types (Ice cream plants)
  - Where are your Supplements
  - Pests (Insects)
  - Weather
  - Fencing
  - Livestock Type
  - Herding and Outriders

# Intensity/Distribution

- How much of the forage is consumed or assigned for animal type
  - Distance from Water
  - Adjustments for Slope

**Table 4.** Grazing reduction with slope for cattle

| Percent Slope | Percent Reduction in Grazing Capacity |
|---|---|
| 0-10 | None |
| 11-30 | 30 |
| 31-60 | 60 |
| Over 61 | 100 (considered ungrazable) |

*Source: Holechek (1988)*

**Table 5.** Cattle grazing reduction with distance from water

| Miles | Percent Reduction in Grazing Capacity |
|---|---|
| 0-1 | None |
| 1-2 | 50 |
| Over 2 | 100 (considered ungrazable) |

*Source: Holechek (1988)*

# Duration

- How long are you grazing in an area
  - **Continuous grazing when properly managed *is* rotational grazing without fences**
  - Deferred-Rotational
  - Rest-Rotational
  - High Intensity-Short Duration
  - Short Duration Grazing

# Other Advice for Drought Management

- Have a flexible herd composition . 1/4 - 1/3 of the total stocking rate should be comprised of yearlings.
- Maintain as much carryover forage as you can.
- Develop a drought reserve pasture. Always have a pasture rested the previous year.
- Cull heavier than normal- Open cows, older cows, and body conditions scores < #4

# Other Advice for Drought Management

- **Don't drought feed.** "Drought feeding leads to overstocking, deteriorated ranges and bankrupt ranchers."

- If you decide to feed your way out of a drought, feed **"energy dense"** supplements because you are short on energy (grass).

- **Sell early-** higher prices and more grass for remaining herd.

# Early Weaning

- Early Weaning
  - Weaning before 7 months of age
  - Reduces the total energy needed by the herd
  - Allows greater recovery period between weaning and calving
    - Reduces winter supplementation costs
    - Improves the chances of each cow maintaining a 365 day calving interval



# Early Weaning Considerations

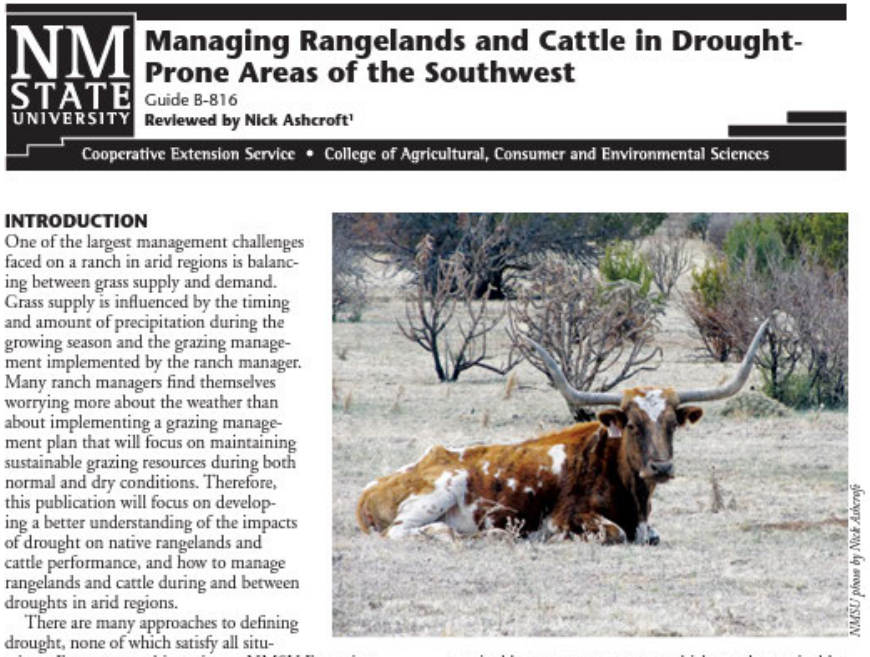
- How early can I wean calves?
  - About 90 days of age
- Should I sell the calves when they are early weaned or feed them until typical marketing time?
  - Calf age & operation dependent
- If I keep the early weaned calves how do I manage them?
  - Calf age & operation dependent

# Forage Saved by Early Weaning

1100-lb cow that weans a 500-lb calf at 7-months old

| Weaning Age, months | Forage Saved, lb/pair | Additional Grazing Days |
|---|---|---|
| 7 | 0 | 0 |
| 6 | 426 | 19 |
| 5 | 806 | 37 |
| 4 | 1136 | 52 |
| 3 | 1422 | 65 |

- Rule of Thumb
  - Every day early weaned ~ .6 grazing days saved



NM STATE UNIVERSITY

**Managing Rangelands and Cattle in Drought-Prone Areas of the Southwest**

Guide B-816

**Reviewed by Nick Ashcroft[1]**

Cooperative Extension Service • College of Agricultural, Consumer and Environmental Sciences

**INTRODUCTION**

One of the largest management challenges faced on a ranch in arid regions is balancing between grass supply and demand. Grass supply is influenced by the timing and amount of precipitation during the growing season and the grazing management implemented by the ranch manager. Many ranch managers find themselves worrying more about the weather than about implementing a grazing management plan that will focus on maintaining sustainable grazing resources during both normal and dry conditions. Therefore, this publication will focus on developing a better understanding of the impacts of drought on native rangelands and cattle performance, and how to manage rangelands and cattle during and between droughts in arid regions.

There are many approaches to defining drought, none of which satisfy all situations. For more on this topic, see NMSU Extension Guide B-825, *Defining Drought on New Mexico Rangelands* (http://aces.nmsu.edu/pubs/_b/B825.pdf). Meteorological droughts are often defined as periods where moisture supply falls below a climatically set threshold, whereas an agricultural drought may be defined as a period of inadequate soil moisture for the needs of crops or growing native grass. However, it is not until the human population experiences shortages of water that affect quality of life and the demand of product (socio-economic drought) that society and government begin to understand the impacts of drought. Regardless of the definition, those who live in arid regions recognize that in a majority of years these regions will experience periods of below-normal precipitation. Rangeland managers in arid climates have come to recognize it is not a matter of **if** but **when** the next drought will begin. Therefore, planning for drought is an important component in sustainable range management, which equals sustainable ranch operations.

Planning and preparing for extended dry periods in arid regions should be a beef business requisite. However, when extended dry periods are encountered, drier than normal conditions are commonly talked about, but the response seldom seems to be quick enough to sustain both native rangelands and an adequate cattle inventory. It is critical to begin assessing and responding to the situation and to recognize both the short- and long-term impacts of drought on native rangelands, livestock, and the economics of a grazing operation.

**IMPACTS OF DROUGHT ON RANGE RESOURCES**

While most ranch managers understand the general scope of drought, it is important to respect the impacts

NMSU photo by Nick Ashcroft

[1]Extension Range Management Specialist, Department of Extension Animal Sciences and Natural Resources, New Mexico State University.

*To find more resources for your business, home, or family, visit the College of Agricultural, Consumer and Environmental Sciences on the World Wide Web at aces.nmsu.edu*

# Resources

B-818: Using a Supplementation Program as a Grazing Management Tool
http://aces.nmsu.edu/pubs/_b/B818/welcome.html
CR-374: New Mexico Range Plants
http://aces.nmsu.edu/pubs/_circulars/cr-374/welcome.html
CR-649: Developing a Grazing System for Arid Climates
http://aces.nmsu.edu/pubs/_b/B806/welcome.html

# QUESTIONS?

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