PASTURE AND RANGELAND MANAGEMENT DURING DROUGHT

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Drought Preparation

Good land management before droughts provides you with management flexibility when droughts occur
Good Land Management

- Maintain healthy soils
  - Conserves water
  - Extends forage productivity during onset of drought

- Integrate crops and livestock
  - Helps build and conserve soil quality
  - Ability to graze unharvestable crops provides management flexibility

- Balance stocking rates and land resources
Drought Concerns

Reduced forage quality and quantity

- Insufficient forages to feed herd
- Obtain additional grazing land
- Reduce herd size
- Feed animals supplements
- Over-grazing
- Feeding on toxic plants
- Poor animal nutrition
Forages and Drought

- Reduced nutritional quality
- Lower forage succulence = lower protein content
- Dry forages are harder to digest than succulent forages
- Toxic plants become more toxic
- Salt concentration in plants increases
Animal Nutrition & Drought

• Lack of protein
  - Decreases efficiency of feed to provide energy
  - Decreases forage digestibility
  - Lowers resistance to diseases and toxins

• Lack of energy
  - Causes weakness
  - Lowers resistance to toxic plants

• Vitamin deficiencies
Protein Supplements

- Enhance growth and health of
  - Young stock and old stock
  - Pregnant or lactating cows

- Enhance resistance to
  - Toxic plants
  - Parasite infestations

- Enhance digestibility of feed
Supplement Use Warnings

- Livestock cannot effectively convert non-protein nitrogen, such as urea, when it is fed with low-energy forages.
- Do not use protein-energy concentrates to “stretch” feed from dry pastures:
  - Low energy availability causes animals not to use these concentrates efficiently.
  - Livestock may degrade pastures if they are allowed to graze drought-affected pastures.
Energy Supplements

• Drought decreases feed availability, which reduces energy availability

• Energy sources
  - Hay
  - Soybean hulls
  - Wheat mids
  - Corn gluten meal
  - Other by-product feeds
Hay as an Energy Supplement

- Harvest hay in good years to prepare for drought
- Use hay that is free of weed seeds
  - Weed seeds pass through animals’ digestive tracts intact
  - Weeds in manure increase infestations in pastures
- Test hay for nutrient content
Increase Feed by Grazing Cropland

• Options for grazing cropland
  - Graze marginal cropland in spring when pastures are most vulnerable to being degraded
  - Graze drought-affected crops that cannot be harvested profitably
  - Graze crop stubble following harvest

• Check crops for nutrient levels
Increase Feed by Renting Land

- **Benefits of renting land**
  - Increases access to forages and water
  - Allows breeding programs to continue

- **Problems associated with rented land**
  - Ensuring quality of forages and water
  - Ensuring stock adapt to new land
  - Preventing stock from bringing diseases and weeds from rented land
Lot Feeding

• As forages become limited, feed animals in sacrifice paddocks
  - Protects against degradation of land and overgrazing of forages in paddocks
  - Decreases energy needed by animals to find forages and water
  - Allows better management of sick or weak animals

• Can increase spread of parasites and diseases
Grazing on Toxic Plants

- Drought increases grazing on toxic plants
  - Initially, selective grazing on non-toxic plants increases toxic plant dominance in pastures
  - Animals are more likely to eat toxic plants when good-quality forages are limited

- Animals that lack sufficient protein, energy, or vitamins cannot tolerate toxins
Toxicity of Toxic Plants

- Drought increases plant toxicities
  - Plants growing under stress produce stronger toxins
  - High-strength toxins require less energy to produce than lower-strength toxins
- Plant toxicity is a greater problem in the arid West
Management of Toxic Plant Feeding

- **Grazing management**
  - Practice good pasture and weed management
  - Do not let malnourished animals graze in pastures known to contain toxic plants

- **Moving animals to new land**
  - Inspect land for toxic plants
  - If palatable plants are unfamiliar in a new range, animals may feed on the familiar toxic plants
Supplements and Toxic Plants

- Supplements increase animal tolerance of toxic plants

- Protein supplements increase digestibility of
  - Plants with terpenoids
  - Plants with tannins

- High-energy supplements increase the
  - Digestibility of plants with cyanide
  - Tolerance of plants with high nitrates
<table>
<thead>
<tr>
<th>Toxin</th>
<th>Plants Species</th>
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<tbody>
<tr>
<td>Cyanide</td>
<td>Arrow grass, White clover, Serviceberry, Chokecherry, Sudangrass, Johnson grass</td>
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<tr>
<td>Alkaloids</td>
<td>Reed canarygrass, Bindweed, Lupine, Larkspur, Jimsonweed</td>
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<td>Fungal endophytes</td>
<td>Tall fescue, Perennial ryegrass</td>
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<td>Tannins, phenols</td>
<td>Birdsfoot trefoil, Lespedeza, Crown vetch, Sainfoin, Oak, Bitterbush</td>
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<td>Terpenes</td>
<td>Sagebrush, Juniper, Pine, Bitterweed, Rubberweed</td>
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<tr>
<td>Nitrates</td>
<td>Oak, Wheat, Pigweed, Sweet clover, Alfalfa, Common mallow, Millet</td>
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Vitamin Deficiencies

- Livestock become deficient in vitamins A, D, and E if they do not have green feeds for more than 90 days

- Other causes of vitamin A deficiency
  - High concentrate diets
  - Bleached hay
  - Feeds exposed to excess sunlight and high temperatures
Mineral Deficiencies

- Livestock may need 1 to 2 % calcium as a supplement if fed grain or cottonseed meal
- Grain and cottonseed are high in phosphorus
- Livestock need a 2:1 calcium:phosphorus ratio in their diet
Risk Conditions for Nitrate Poisoning

- Animals are deficient in protein, energy, trace minerals, or vitamins
- Nitrates have accumulated in forages or crops fertilized just before a drought
- Malnourished animals gorge themselves on heavily fertilized and rapidly growing forages
- High concentrations of nitrate accumulating plants such as pigweed and sweet clover
Prevention of Nitrate Poisoning

• **Forage management**
  - Avoid excess applications of N fertilizer or manure
  - Sample and test feedstuffs
  - Use forages to make silage, aerating it

• **Livestock management**
  - Have animals regain vigor before grazing on lush forages
  - Do not feed animals high-nitrate supplements when they are grazing high-nitrogen forages
Risk Conditions for Prussic Acid Poisoning

- Affected plants are sorghum, sudangrass, and Johnson grass
- Frost or drought occurs when these forages are young and tender
- High risk grazing practices
  - Malnourished animals graze affected forages
  - Low forage diversity and a high concentration of Prussic acid accumulating plants in the paddock
Prevention of Prussic Acid Poisoning

- **Prevention through forage management**
  - Test forages for prussic acid
  - Bright-green forages may be high in prussic acid; cut and cure until the sun bleaches the bright-green color before making hay

- **Prevention through grazing management**
  - Gradually build up time animals are on pasture following a drought
  - Allow forages to regrow following a freeze or drought before grazing animals
Aflotoxin: Causes and Risks

- **Causes of aflotoxin poisoning**
  - Causal agent are the fungi *Aspergillus flavus* and *Aspergillus parasiticus*
  - Infects corn, peanuts, cottonseed, and tree nuts in the field or, more commonly, in stored feeds

- **High-risk conditions for aflotoxin**
  - Plants stressed by drought, or damage by insects, birds, hail, or early frost
  - High temperatures and high relative humidity

- **Aflotoxin is most common in southern U.S.**
Prevention of Aflatoxin Poisoning

• Test harvested feed and forages for aflatoxin
  - Test feed that was grown or harvested under high risk conditions
  - Do not feed animals contaminated feedstuffs

• Contaminated feeds can be cleaned and reconditioned to minimize loss
Summary of Forage Management Decisions

• Use forages effectively without degrading land
• Supplement forages with protein and energy supplements
• Find additional land to increase access to forage and water
• If additional land is not available, feed animals in feedlots or sacrifice pastures
• If animals continue to graze, manage to minimize poisoning risks from toxic plants
Herd Management Decisions

- Use best paddocks for nursing and reproductive stock
- Reduce stock numbers and stocking rates
  - Prioritize mature animals
  - Sell young stock
- Consider value of current stock compared to the cost of replacement stock
Cow Management During Droughts

- Graze pregnant and nursing animals on better quality pastures
  - Lactation increases nutrient needs
  - Young calves need good quality feed
- Graze dry cows on lower quality pastures
Wean Young Stock Early

- Early weaning allows you to transfer dry cows to lower quality pastures

- Young stock important to breeding herd
  - Hand feed
  - Provides better control of feed intake, better growth, and more timely onset of sexual maturity

- Young stock not important to breeding herd
  - Sell early
  - Reduces feed and management expenses
Reduce Herd Size

- Optimizes animal growth on existing land
- Reduces management expenses
  - Cost of land rental
  - Cost of feed supplements
  - Cost of supplemental water
- Minimizes damage to forage and soil resources
Sell Livestock Early

- Selling at the onset of a drought lets you get a higher price than if you sold later

- Selling early saves costs associated with feed and livestock management

- Reducing your herd provides options for improving your herd following the drought
Sell Livestock Selectively

- **Sell these animals first**
  - Yearling stockers
  - Open cows
  - Low or poor producers
  - Non-conformers
  - Animals that are difficult to handle

- **Keep quality breeding stock**
Economic Decisions During a Drought

- What is your current financial condition?
- How much financial risk can you afford?
- What are your family and farm goals?
- How soon must you be able to recover losses incurred during the drought?
- Which assets are most expendable?
Cost Comparisons During a Drought

- Condition of land and water resources
  - How much grazing pressure can they withstand?
  - What will be the time and cost to restore or revitalize these resources following the drought?

- Cost of supplements compared to rental land

- Cost of replacement stock compared to
  - Value of current stock
  - Cost of maintaining current herd
Summary

- Prepare for drought by using good land management practices
- Decrease stocking rates as drought decreases land productivity
  - Sell livestock early and selectively
  - Enhance feed for remaining livestock by using additional land and feeding supplements
  - Protect animals from toxic plants and feeds
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