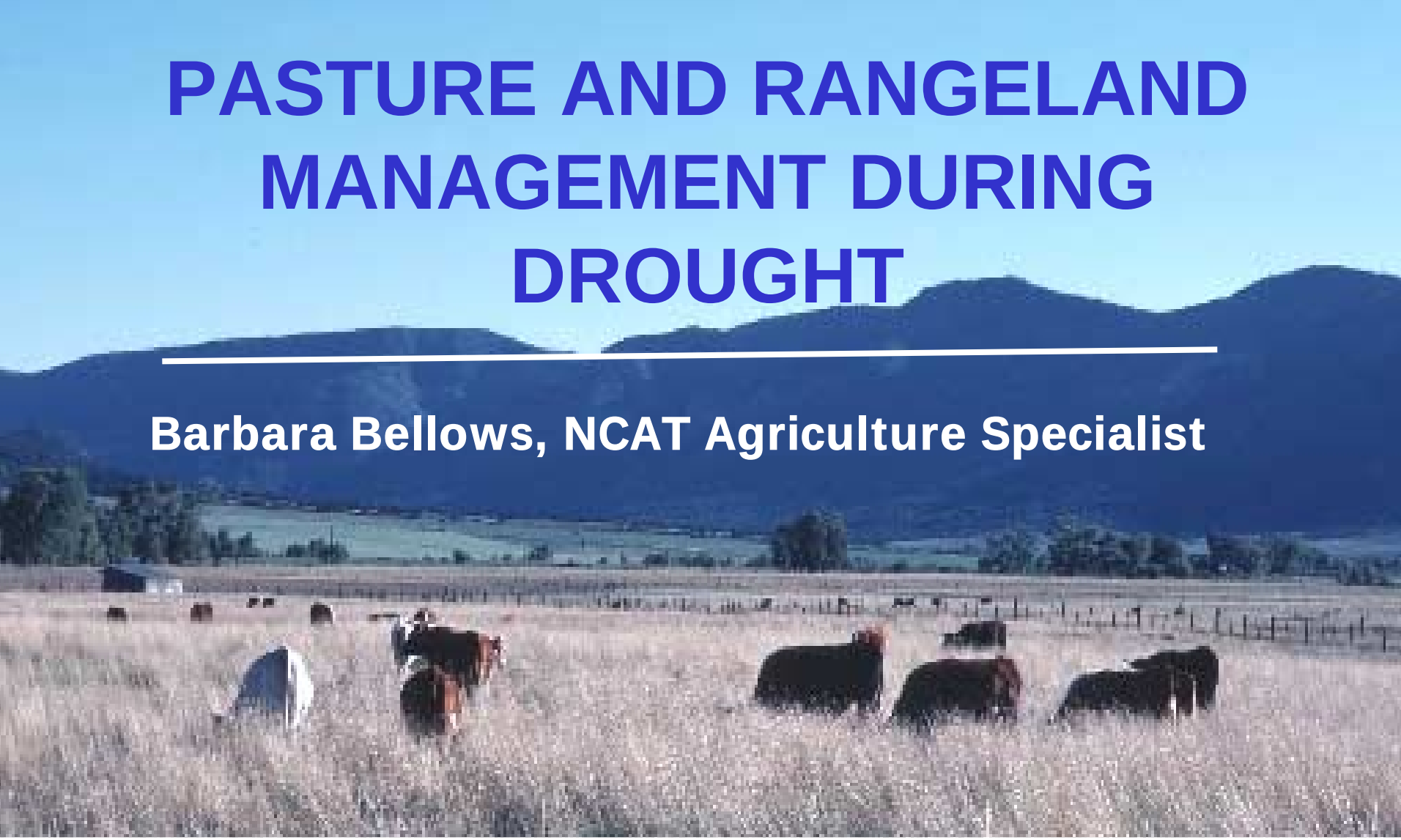
PASTURE AND RANGELAND MANAGEMENT DURING DROUGHT



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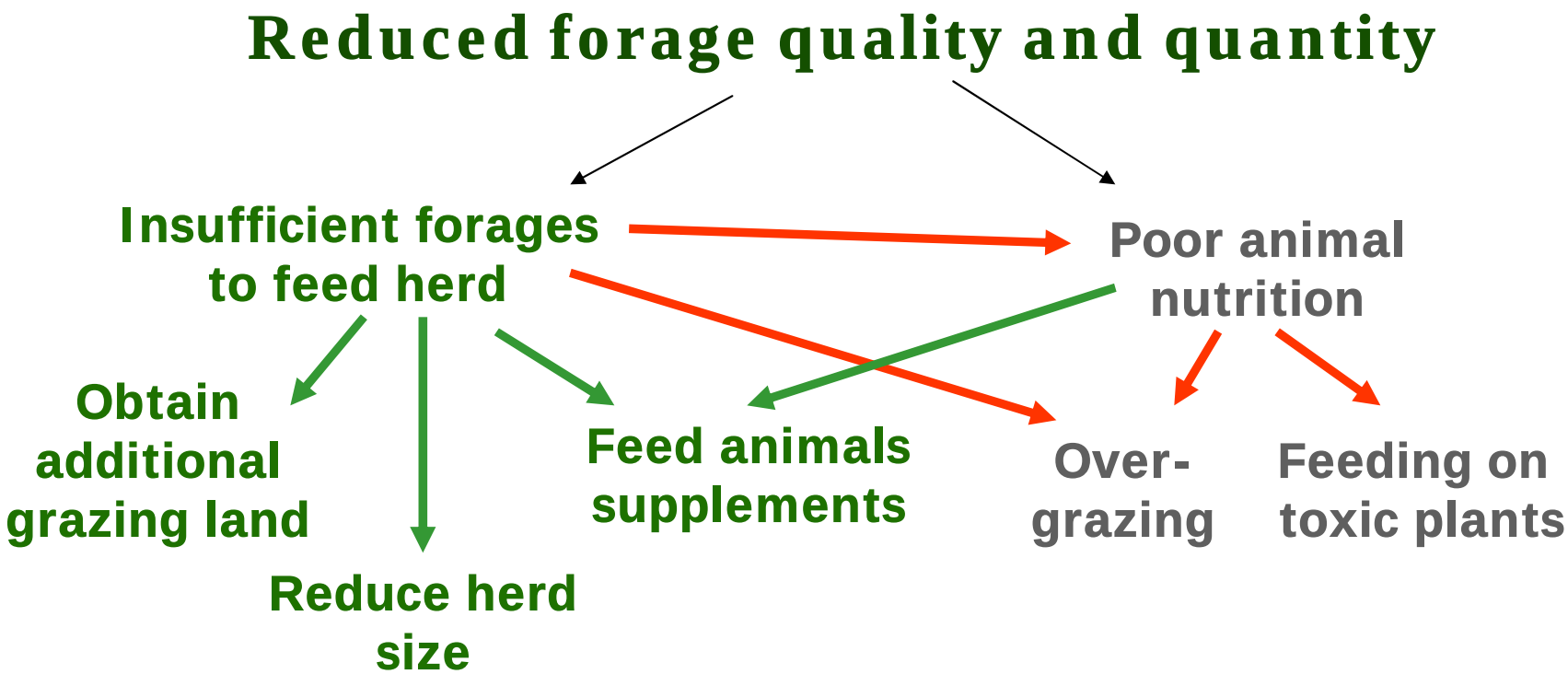
Drought Preparation

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



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

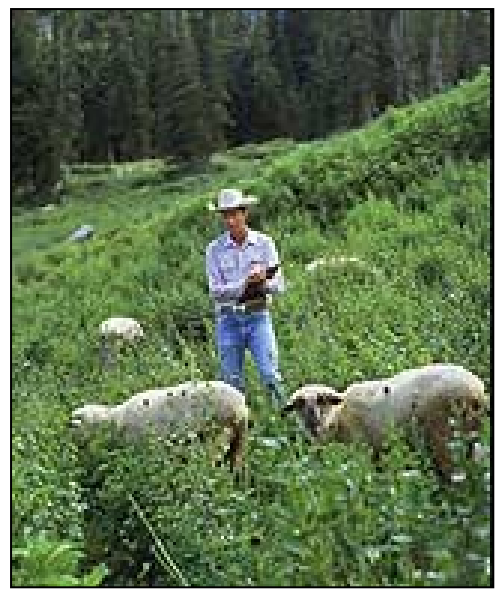
- **Plant toxicity is a greater problem in the arid West**

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**



Toxin	Plants Species
Cyanide	Arrow grass, White clover, Serviceberry, Chokecherry, Sudangrass, Johnson grass
Alkaloids	Reed canarygrass, Bindweed, Lupine, Larkspur, Jimsonweed
Fungal endophytes	Tall fescue, Perennial ryegrass
Tannins, phenols	Birdsfoot trefoil, Lespedeza, Crown vetch, Sainfoin, Oak, Bitterbush
Terpenes	Sagebrush, Juniper, Pine, Bitterweed, Rubberweed
Nitrates	Oak, Wheat, Pigweed, Sweet clover, Alfalfa, Common mallow, Millet

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 alflotoxin**
  - 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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