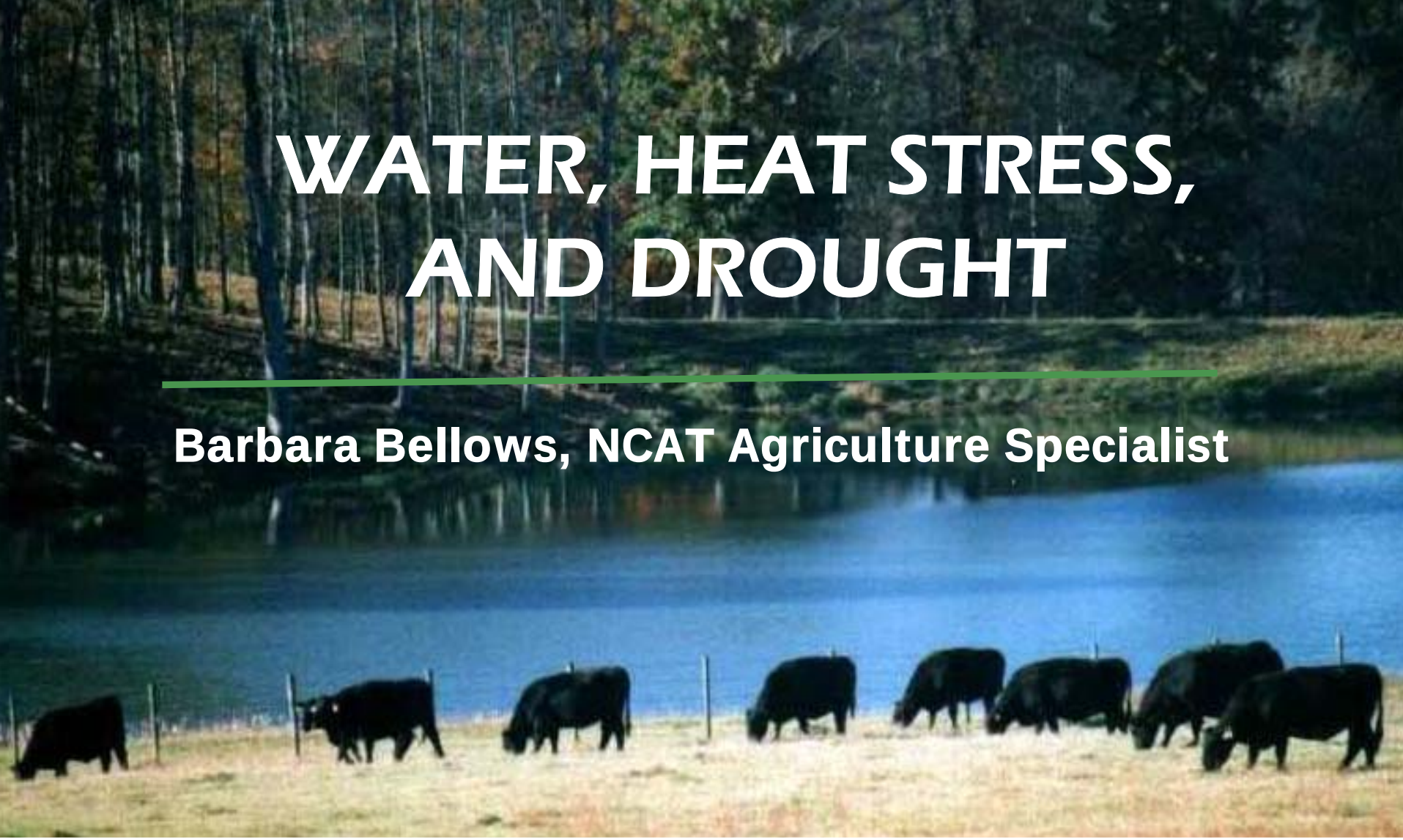

WATER, HEAT STRESS, AND DROUGHT

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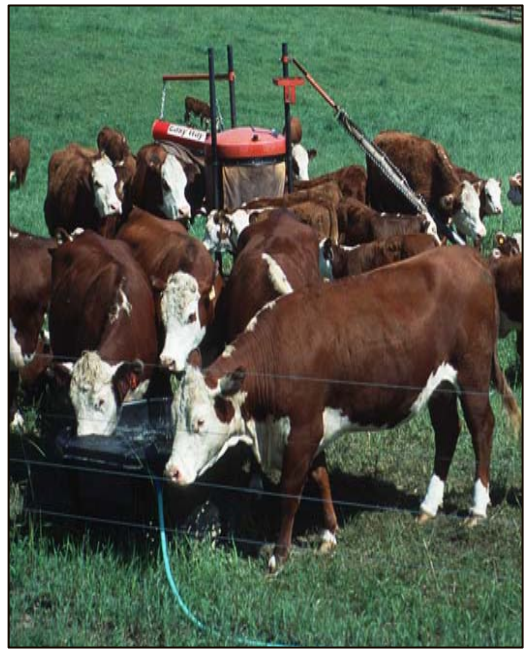
NCAT

Livestock Water Use Criteria

- **Animal characteristics**
  - Animal species and breed
  - Animal size
  - Animal age and condition
- **Pasture conditions**
  - Forage type and condition
  - Distance to water
- **Environmental conditions**
  - Average daily temperature
  - Water quality

Livestock Daily Water Needs

- 1000 lb dairy cow - 30 gallons
- Dry beef cow - 22 gallons
- Beef cow-calf pair - 20 gallons
- 600 lb beef heifer – 12 gallons
- 2000 lb beef bull - 19 gallons
- Sheep or goat - 2 gallons



Goats, Sheep, and Water

- **Sheep and goats can survive longer in drought than cattle**
  - **Smaller size**
  - **Able to subsist on desert and semi-arid plants**
  - **Many breeds are drought tolerant**

- **Multi-species grazing with cattle allows you to better balance pasture resources with herd size**

Water Use by Young Animals

- Young animals need more water than adults
- A greater percentage of young animals' body weight is water
- Young animals need to drink more often
  - They take in less water at a time
  - They have a more rapid metabolism

Forages and Water Needs

- **Lush forages decrease livestock water needs**
  - They contain 75-80% moisture
  - Livestock can get some of their water from this lush forage
- **Dry forages increase livestock water needs**
  - Hay and dry feed contains only 10-12% moisture
  - Animals need water to digest and move dry, fibrous feed through their gut

Ensure Animals Have Water

- **Conserve water in tanks**
  - Fill tanks using animal-activated valves
  - Decrease evaporation by having tanks partially covered
- **Save or bring in water**
  - Collect water in advance of drought
  - Use trucks or solar pumps to bring in additional water
- **Lease additional land with access to water**
- **Reduce herd size to reduce water need**

Distance to Water

- **Sheep and cattle can forage up to 3 miles from water points**
- **Animals that need to drink more than once a day cannot forage as far**
  - **Pregnant and lactating females**
  - **Young animals**
  - **Animals eating dry feed or forages**
- **Greater distance to water increases trail formation**

Water Trapping / Collection

- **Trap water in fields with swaths of crop stubble**
  - Swaths should be cut perpendicular to prevailing winds
  - Swaths collects snow in winter, adding meltwater to soil as temperatures warm
- **Water collection structures**
  - Contour ridges
  - Check dams
  - Percolation ponds
  - Holding tanks

Livestock Need Clean Water

- Improves animal's metabolism
- Lowers risk of parasites and diseases
- Promotes healthy growth

Drinking Water Contamination

- **Salinization**
  - Water evaporation in troughs and shallow tanks
  - Water evaporation from ponds in saline soil
- **Toxic blue-green algae grow in nutrient-rich ponds**
- **Parasites**
  - Animals deposit manure in streams and on streambanks
  - High temperatures and stagnant water favor microbial growth

Salt Increases Water Use

- **Salt intake increases animal need and desire for water**
- **Sources of salt in diet**
  - **Plants with high salt content, such as saltbrush**
  - **Saline water**
  - **Salt and mineral licks**

Salt Tolerance

- **Animals with low salt water tolerance**
  - Young animals
  - Pregnant or lactating females
  - Aged or weakened stock

- **Symptoms of high salt intake**
  - Depressed appetite
  - Depressed growth rate
  - Scours

Toxic Blue-Green Algae

- **Risk conditions**
  - Stagnant ponds
  - Low water flow in streams
  - High nutrient levels in water
  - Hot, sunny days

- **Prevention**
  - Fence off stagnant ponds
  - Provide animals with access to clean water

Drought and Riparian Areas

- **Why animal congregate in riparian areas**
  - Drinking water
  - Seeking shade and breezes
  - Grazing on riparian vegetation
- **Riparian degradation by livestock**
  - Overgrazing riparian vegetation when upland vegetation is sparse
  - Trampling and compacting streambank soil
  - Depositing manure in and near streams

Riparian Degradation

- **Impacts of trampling and overgrazing**
  - Bare soil
  - Increased soil erosion and nutrient loading
  - Increased evaporation and lower water table
  - Establishment of noxious plant species

- **Degradation of fish and wildlife habitat**
  - Loss of food
  - Loss of shade and hiding areas

Healthy Riparian Areas

- **Water table level**
  - Height changes little throughout the year
  - Moist soil extends about two channel widths beyond either bank
- **Dense vegetation coverage**
  - Predominantly native plants
  - Diversity of young and mature grasses, forbs, and woody plants
  - Includes plants with deep, strong root systems

Keep Riparian Areas Healthy

- **Keep livestock away from streams and ponds**
  - Pump water from streams into drinking tanks
  - Fence riparian areas
  - Place feed supplements and insect control away from water bodies

- **Manage riparian grazing**
  - Graze only when soils are dry
  - Prevent overgrazing
  - Do not graze when riparian plants are reproducing

Causes of Heat Stress

- **Environmental conditions**
  - High temperature — above 80°F day, 70°F night
  - High humidity
  - Limited air movement

- **Management factors**
  - Limited access to water
  - Poor water quality
  - Lack of shade, especially for animals with light-colored hair
  - Handling or hauling animals in hot weather

Heat Stress Concerns

- Low feed consumption
  - Depressed appetite
  - Difficulty digesting dry feed
- Poor weight gain
- Susceptibility to disease
- Excessive salt intake
- Death

Keep Animals Cool

- Provide access to shade
- Prevent congregation in windbreaks that prevent air movement
  - Provide animals in barns or sheds with good ventilation
  - Provide sprinklers to cool animals

Heat Stress Management

- **Water and feed management**
  - Provide animals with plenty of clean, fresh, and preferably cool drinking water
  - Provide animals access to salt and minerals
  - Provide additional water to allow effective use of supplements
- **Avoid handling animals during hot weather, such as between 10 a.m. and sundown**

Summary

- **Ensure that animals have access to sufficient clean water**
  - Breed and species determines water consumption
  - Age and health affects grazing distance from water

- **Protect water quality by**
  - Protecting riparian areas
  - Preventing salinity buildup
- **Prevent heat stress by**
  - Providing shade and water
  - Not working animals during hot weather

Stream Protection Benefits

- Decreased buildup of nutrients, salt, and other contaminants in water
- Decreased trampling in streams and ponds
- Less manure concentration near water
- Streambank vegetation protected
- Increased water infiltration and storage in riparian zone