

October 2013 Blizzard in South Dakota: Ramifications



Ken Olson, Extension Beef
Specialist

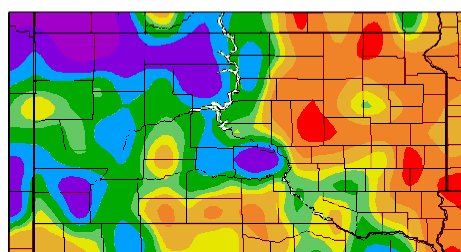
Russ Daly, Extension Veterinarian

© 2013 Board of Regents, South Dakota State University
iGrow.org

Late Fall 2013

- Warmer than normal
- Good moisture
- Implications:
 - Fall forage green-up
 - High moisture
 - High protein
 - Lower energy
- No need to wean early – calves nursing on pasture
- Cows still on summer pasture
- No winter coats yet

Percent of Normal Precipitation (%)
7/1/2013 – 9/30/2013



Generated 10/11/2013 at HFRDC using provisional data.

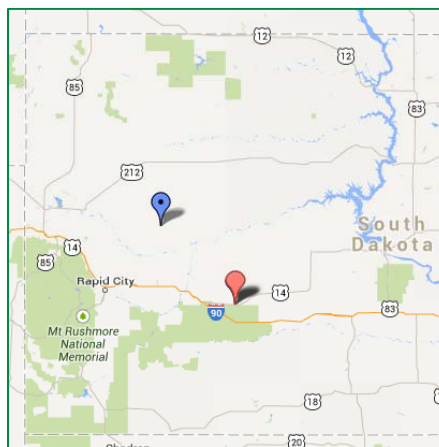
Regional Climate Centers

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Thursday night, Oct.3: Rain

- Rain totals before turning to snow Friday PM:
 - Union Center – 1.26"
 - Cottonwood – 1.64"
 - ~ 10% of annual precipitation
- Implication: Cattle were literally “soaked to the skin”



© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Observation: Thermoregulation

- **Lower Critical Temperature:** Effective temperature below which an animal expends energy to maintain body heat and metabolism
- For each 1° below LCT, energy requirements ↑ by 1-2%

Coat Condition	Critical Temperature °F
Wet or Summer Coat	59°
Dry, Fall Coat	45°
Dry, Winter Coat	32°
Dry, Heavy Winter Coat	18°

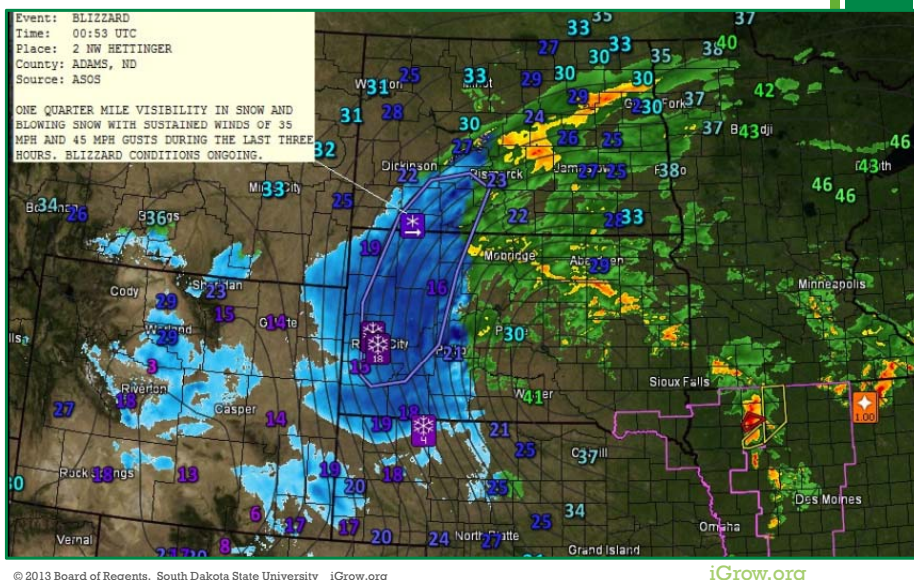
Ref: Ames, DR;
1978

- Wind chills during storm = as low as 12 – 16 F
- Cows needed to ↑ energy intake by 47 – 94% just to maintain
- Energy deficits + energy expended = hypothermia

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Friday afternoon, Oct. 4: Blizzard



Friday afternoon, Oct. 4: Blizzard

- @ Union Center:
 - Hourly average sustained winds = as high as 49 mph
 - Peak wind gust = 62 mph
 - 12" of snow - 3-4' snowdrifts
- Elsewhere:
 - Many areas 20-30" snow (58" in Black Hills) – 6-7' drifts
 - 71 mph peak wind gust @ Ellsworth AFB
- Cattle bunched and drifted with wind
 - Fences breached

“I don’t have to worry about being a rancher anymore because all my cows are laying dead in elm creek”

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

The screenshot shows the iGrow website interface. At the top, there is a search bar and a navigation menu with links: Home, Grow Store, News, Events, Support Grow, and RSS. Below the navigation menu, there are tabs for different categories: 4-H & YOUTH, LIVESTOCK, AGRONOMY, HEALTHY FAMILIES, COMMUNITY DEVELOPMENT, and GARDENS. The main content area displays an article titled "Understanding What Happened" by Dave Ollila, dated 10/11/2013. The article features a photo of a snowy landscape with trees and a small building. To the left of the article is a sidebar with a "Livestock" section containing links for Beef, Dairy, Horse, Pork, Profit Tips, and Sheep. Below this is an "About the Author" section with a photo of Dave Ollila. To the right of the article is a "Related Articles" section with links to "October Blizzard", "Animal Health Concerns Following October Blizzard", "Grass Tetany Concerns", "Animal Well-Being Amidst Weather Disasters", and "Blizzards Challenge Even the Most Experienced Cattleman". At the bottom of the sidebar, there is a "SIGN UP FOR EMAIL!" button and a "FIELD STAFF LISTING" button. The article text discusses the high death loss from the early October blizzard in South Dakota and the public wondering "How could this happen?".

© 2013 Board of Regents, South Dakota State University iGrow.org

Observation: Causes of Death

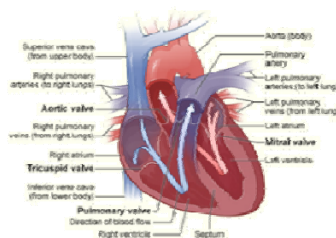
- Hypothermia
- Entrapment in fences → exhaustion
- Entrapment in mud (creeks and stock dams) → exhaustion
- Drowning in creeks and stock dams
- Exhaustion on dry land
- Pulmonary edema secondary to exertion

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Observation: Pulmonary Edema

- Common observation: “gallons of fluid” pouring from nose and mouth of carcasses when moved
 - “Drowned standing up”
- Cold temperatures + exertion + physiologic stress → sympathetic nervous system response
 - Renin – Angiotensin – Aldosterone System activated
 - Blood vessels constrict
 - Increased resistance in systemic arteries
 - Heart has to work harder to pump against resistance

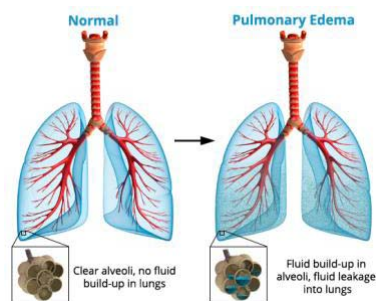


© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Observation: Pulmonary Edema

- Aldosterone stimulates kidneys to hold on to sodium and water
 - Increased blood volume and blood pressure
- When left heart can no longer pump blood against this resistance, pulmonary edema occurs
 - Fluid enters airways and accumulates
 - Increased difficulty for blood/O₂ exchange



© 2013 Board of Regents, South Dakota State University iGrow.org

“Dryland Drowning”?


- When freshwater taken into lungs:
 - Water pulled from airways into lung blood vessels by osmosis
- Contrast with saltwater drowning
 - Osmosis pulls water from bloodstream into lungs



© 2013 Board of Regents, South Dakota State University iGrow.org



13-17889

 **South Dakota State Animal Disease Research & Diagnostic Lab**
Box 2175, North Campus Drive
Brookings, SD 57007
605.688.5171 605.688.6003 (fax)
email: sdsu.adrdl@sdsu.edu website: http://sdsu.edu/vs

POST-MORTEM FORM

Number: _____ Date: BH2V

Species: Bovine # in Herd: 120
Breed: Angus # Dead: 100
Age: 3 Sex: F # Sick: _____

Animal ID Number(s): _____

CHECK ANY THAT APPLY:

☐ Diarrhea ☐ Pneumonia ☐ Lameness
☐ Abortion ☐ CNS ☐ Other _____
☐ Vaccinations _____

DVM _____
Clinic: Nottingham Vet CL
Address: 751 Pine View Dr.
City: Sturgis
State: SD Zip: 57785
Phone: 605-317-3606 Fax: 605-720-1347

Observations: Following the Storm

- “Transport tetany”
 - Signs = Hyperexcitable → tremors → recumbency
 - Long-term feed & water deprivation
 - Rapid resumption of feed and water
 - Exacerbated by hypomagnesemia (grass tetany)
 - Fall green-up of pastures



© 2013 Board of Regents, South Dakota State University iGrow.org

Observations: Following the Storm

- Bloating in calves
 - Disruptions in feeding
 - Rapid resumption afterwards → acidosis?
- Exertional rhabdomyolysis (“tying up”) in horses
 - Prolonged muscular exertion
 - Muscle cell damage → myoglobin release into bloodstream
 - Potential for kidney failure in extreme cases
- Behavioral changes – aggression in cows



© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Weeks Following the Storm

- Any long-term stress event:
 - Increased blood cortisol levels
 - Shift immune system towards Th-2 response (antibodies) & away from Th-1 response (CMI)
 - 2 weeks after storm
- Increased susceptibility to BRDC – especially native viruses
- Diminished response to vaccines
- Pinkeye



© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Weeks Following the Storm

- Changes in management
 - Weaning calves – starting on feed
- Reproduction
 - Fetal losses in very stressed animals
 - No evidence to suggest fetal losses will be widespread
 - Sublethal effects on fetus = ??



© 2013 Board of Regents, South Dakota State University iGrow.org

Lessons

- Be prepared for follow-up
 - Tetany conditions
 - Bloat
 - Pinkeye
- Manage feed resumption?
- Adjust management to allow for stress levels in cattle
 - Vaccines
- Animal ID
- Good management and proper animal care may not always be enough



© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

What Came Afterwards?

- Tremendous support from throughout the World



© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Community Gatherings



Community Gatherings

- October 17: 1st event, City of Sturgis sponsored a steak dinner at Union Center
 - About 900 attended
- October 25 – November 2: Ranch Family Community Gatherings, Union Center, Faith, New Underwood, Belle Fourche, Hot Springs, Philip
- December 17-18: “After The Storm: What’s Next”, Faith, New Underwood, Union Center, Newell, Hot Springs
- April 14-15: Livestock Disaster Program Community Gatherings, Hermosa, Eagle Butte, Interior, Union Center

Donations

- Rancher Relief Fund



- Heifers for South Dakota



© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Rancher Relief Fund



- Established October 8 by SD Stockgrowers, SD Cattlemen's, SD Sheepgrowers
- Priorities:
 - Help hardest hit
 - Financial assistance to as many as possible
- Black Hills Area Community Foundation, SD Volunteer Organizations Active in Disasters, Lutheran Social Services, Catholic Social Services
- Accepted applications by or nominations of impacted producers

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Rancher Relief Fund



- Results as of April 17:
 - Livestock losses reported: ~43,000 and counting
 - ~36,000 cattle/calves
 - ~6,500 sheep
 - ~500 horses
 - More than \$5 million donated
 - ~\$4.2 million distributed to 600 producers in January
 - Steering committee to distribute ~\$1 million remaining in near future

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Heifers for South Dakota



- Donations:
 - Quality breeding stock
 - Monetary
 - North Central Resource Conservation and Development Association of SD
- Focused on young families and those starting out
 - 15-20 head to each
- October 19: 350 head pledged, \$11,000 donated

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Heifers for South Dakota



- Donations as of January 18
 - 714 head of cattle delivered to 68 families
 - 176 head (mostly replacement heifers) to be delivered after AI
 - Value of donated cattle > \$1.25 million
 - \$265,000 monetary donations
 - Transportation costs
 - Purchased cattle to donate

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org

Farm Bill

- Livestock Indemnity Program (LIP)
- Livestock Forage Loss Program (LFP)
- Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP)

© 2013 Board of Regents, South Dakota State University iGrow.org

iGrow.org



Acknowledgements

- SDSU Extension
 - Russ Daly
 - Dave Ollila
 - Warren Rusche
 - Dennis Todey
 - George Perry
 - Adele Harty
- SDSU Vet & Biomed Sciences
 - Dale Miskimins
 - Regg Neiger
- Colorado State University
 - Joe Neary
- SD Animal Industry Board
 - Dustin Oedekoven
 - Todd Tedrow
 - Mendel Miller
- South Dakota veterinarians
 - John Allan, Hermosa
 - Ethan Andress, Lodgepole
 - Scott Cammack, Sturgis
 - Vicki Cook, Rapid City
 - Erica Koller-Ross, Edgemont
 - Stephanie Stevens, Edgemont
- West River ranchers