

# Multi-Species Mortality Composting Demonstrations and Outreach in SW Nebraska

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# Partners

- Nebraska
  - USDA-NRCS
  - Nebraska College of Technical Agriculture
  - UNL Extension
- Montana
  - MSU Extension (basic consulting and advising)



# Objectives

- Test and demonstrate mortality composting of multiple species
- Validate or modify commonly published recommendations
- Promote environmental, economic, and biosecurity benefits
- Address social concerns with companion species and recreational horses

# UNIVERSITY OF Nebraska NCTA

## ***LARGE ANIMAL COMPOSTING DEMONSTRATION***

UNIVERSITY OF  
Nebraska  
Lincoln<sup>®</sup> | EXTENSION



NRCS

**United States Department of Agriculture**  
Natural Resources Conservation Service

"USDA is an equal opportunity provider and employer."

# NCTA



# About NCTA

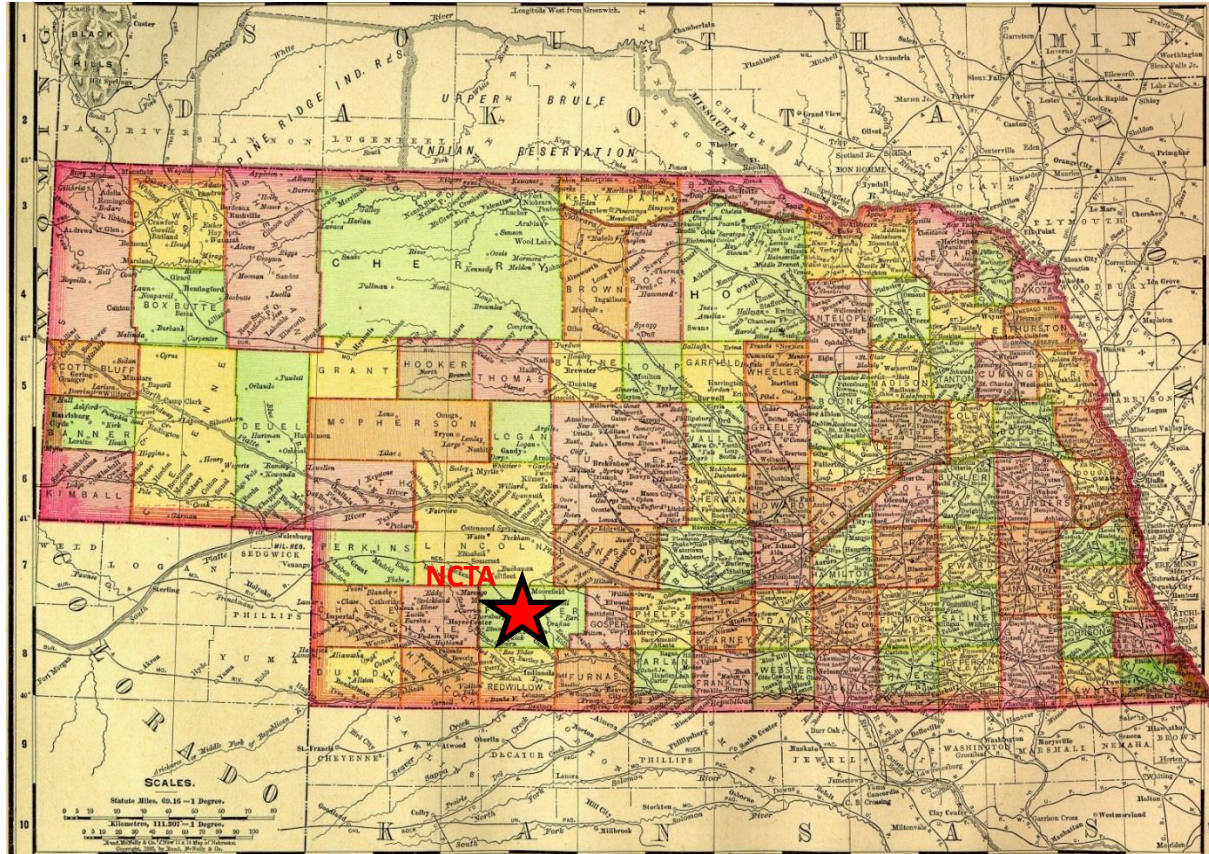
- Nebraska College of Technical Agriculture, located in Curtis, NE

Student Population - 400

*MAJOR FIELDS OF STUDY*

- Agronomy and Horticulture
- Veterinary Technology
- Ag Education and Animal Science
- Equine Studies with a Rodeo Team and Ranch Horse Team

# A little Geography and Climate



Curtis is located in the southwest corner of Nebraska, in Frontier Co.

# Curtis Nebraska Facts

- Elevation – 2500 feet
- Average Annual Rainfall – 21.6 inches
- Average Annual Snowfall – 28 inches
- Resident population of 700 or so
- 250,000 head of cattle on feed within 30 mi.
- 50,000 cow/calf pairs within 30 miles



# 2013 Demonstration Overview

- 8 animals starting May 20,2013
- 1 – Adult cow
- 2 – Adult horses
- 2 - baby calves
- 2 – feedlot steers (600 pounds)
- 1 – roping steer (500 pounds)
- Last animal was placed December 12, 2013
- Piles were turned every 3 months or so
- All piles exposed June 20, 2014

# 2013 Demonstration Overview

Dec. 12, 2013 Pile #8



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# 2013 Demonstration Overview

Site is about a mile north of campus on the school property



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# 2013 Demonstration Overview

January 6, 2013 – Day 26

...THE NORTH PLATTE NE CLIMATE SUMMARY FOR JANUARY 6 2014...

CLIMATE NORMAL PERIOD 1981 TO 2010

CLIMATE RECORD PERIOD 1874 TO 2014

WEATHER ITEM	OBSERVED VALUE	TIME (LST)	RECORD VALUE	YEAR	NORMAL VALUE	DEPARTURE FROM NORMAL	LAST YEAR
.....							
TEMPERATURE (F)							
YESTERDAY							
MAXIMUM	19	323 PM	64	2006	38	-19	40
				1965			
MINIMUM	-15	607 AM	-24	1875	11	-26	5
AVERAGE	2				24	-22	23



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# 2013 Demonstration Overview

What about the bones?



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# 2013 Demonstration Overview

## Particle Size



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# 2013 Demonstration Overview

- We were pleasantly surprised at the results
- Encouraged for another go at this process

# 2014 Demonstration Overview

## Multi-Species Composting



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# Carbon Sources



100 Head of horses and a 100 head beef feedlot on Campus

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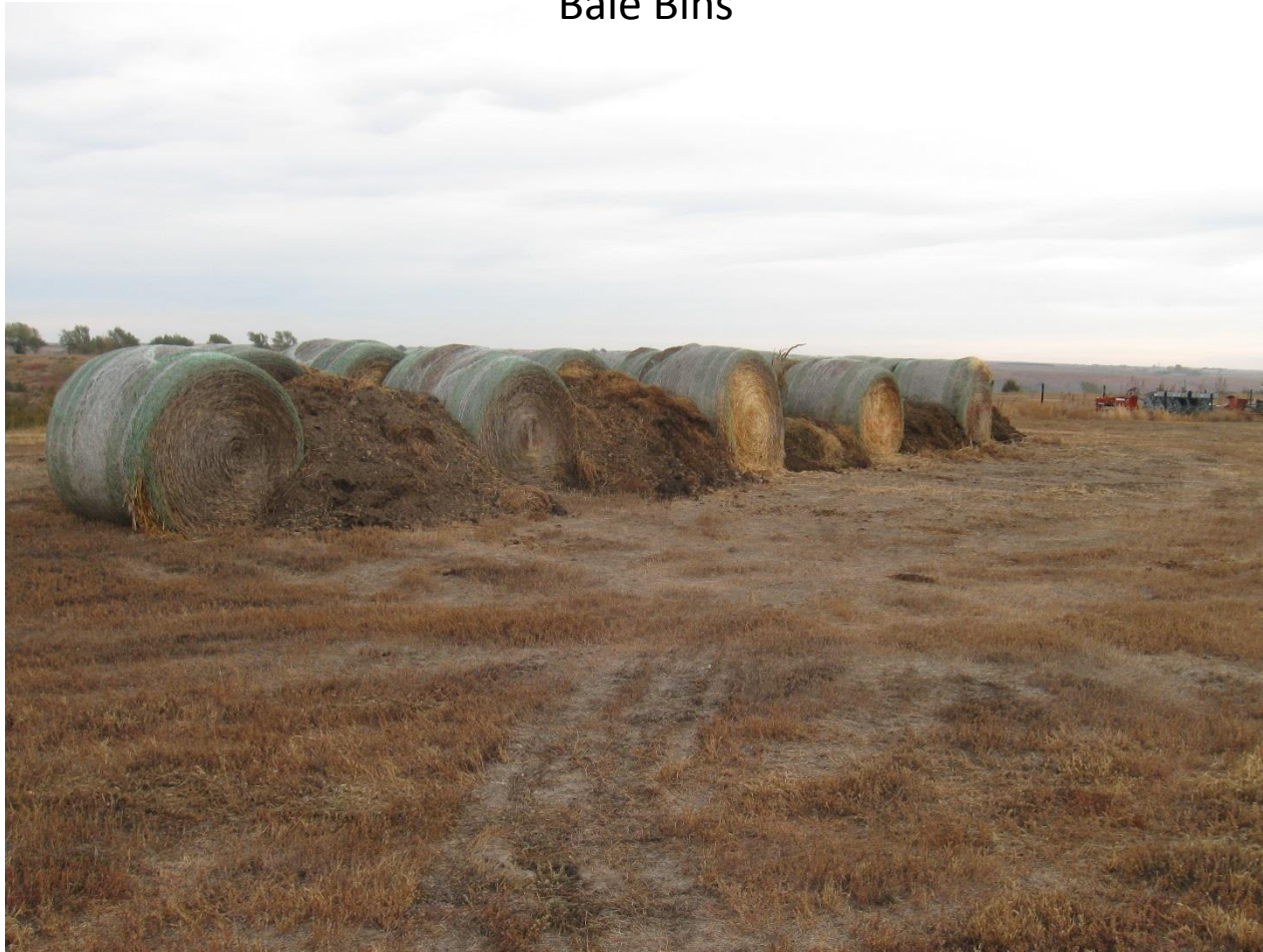
# Composting Site Overview



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# Composting Site Overview

Bale Bins



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# Composting Site Overview

Pallet Bins



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# Composting Site Overview

Static Pile



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# Performance: Hog and Lamb

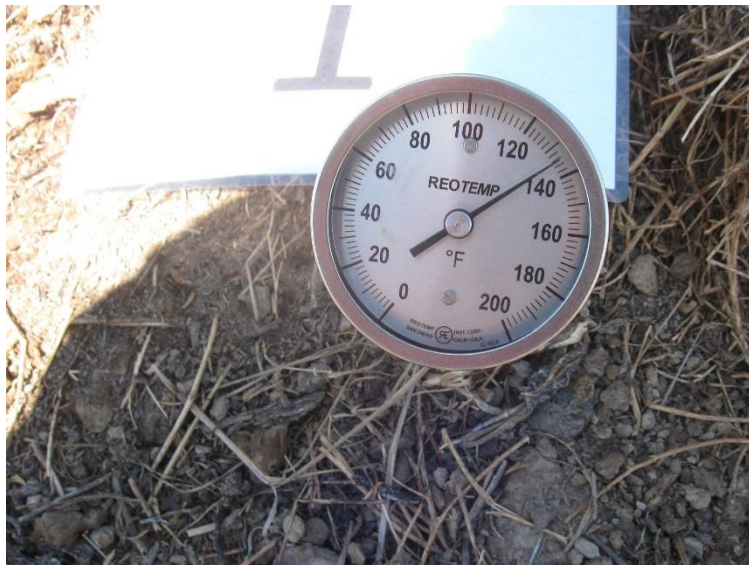
September 9, 2014, a 280# butcher hog in Bale Bin #1  
and 140# butcher lamb in Bale Bin #2



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# Performance: Hog and Lamb

October 20, 2014 Bin #1 and #2, Day 41



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# Performance: Hog and Lamb

October 27, 2014 Bin #1 and #2, Day 48



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# Performance: Hog and Lamb

January 26, 2015 Bin #1 and #2, Day 139



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# Performance: Hog and Lamb

January 26, 2015 Bin #1 – Butcher Hog, Open up and stir, 139 Days



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# Performance: Hog and Lamb

January 26, 2015 Bin #2 – Butcher Lamb, 139 Days



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# Performance: Hog and Lamb Conclusion and Observations

We were surprised at the results and did not try for a second heat cycle.

The temperatures attained almost completely consumed the animals. If this will holds true in the future we will adjust our protocol for swine and sheep.

# Frozen Cow Experiment

- Died November 25<sup>th</sup>, 2014
- Discovered November 28<sup>th</sup>
- Placed in Compost Bin 5-6 December 2<sup>nd</sup>
- Internal temperature of mature cow

“Frozen Throughout”

# Frozen Cow Experiment

January 26, 2015



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# Frozen Cow Experiment

January 26, 2015, Day 55



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# Frozen Cow Experiment

February 10, 2015, Day 70



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# Frozen Cow Experiment

March 6, 2015, Day 94



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# Frozen Cow Experiment

March 24, 2015



Multi-Species Mortality Composting – Norfolk NE

# Frozen Cow Experiment

March 24, 2015



Multi-Species Mortality Composting – Norfolk NE

# Frozen Cow Experiment

March 24, 2015



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# Frozen Cow Experiment

March 27, 2015, day 3



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# 2015 Static Pile Results

Beginning on October 24, 2014 we place 2 horses and 2 roping calves in the pile.



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# 2015 Static Pile Results

October 27, 2014 – Day 3!!!!



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# 2015 Static Pile Results

By November 6, 2014 we reached a peak temp of 141 degrees



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# 2015 Static Pile Results

By January 26, 2015 it was time for another heat cycle



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# 2015 Static Pile Results

We tried a different technique for “Fluffing” our pile



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# 2015 Static Pile Results

Opened up the piles to introduce air and add moisture



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# 2015 Static Pile Results

The results were astounding in 15 days, February 10, 2015



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# 2015 Static Pile Results

March 6, 2015, Day 39 from turn, 120 degrees



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# 2015 Static Pile Results

March 24, 2015, 57 days, 100 degrees add frozen cow



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# Mortalities by the Numbers

- 2.3 to 2.7 Million cattle on feed in NE
- 40,000 mortalities ( 1.5%)
- 1,770,000 baby calves @7% = 124,000 baby calves.
- 9.2 million horses in US – 200,000 equine carcasses disposed each year
- 43 million dogs, 75 million cats in US
- 4 million dogs/cats Euthanized at shelters yearly

# Veterinary Teaching Animals

- In the course of veterinary education, companion animals are used as a learning tool similar to a text book.
  - NCTA suggested composting
  - Concerns and discussions
  - Special precautions and management
  - Fate of compost



# Performance: Veterinary Animals

- 5 canines of various sizes were placed in Pallet bin #5
- We failed to achieve any temperature rise
- Body mass may have been the issue.

# Performance: Veterinary Animals



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# Nuisance Issues

- Odors
- Scavengers
- Insects

# Thank you for your time and attention!

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