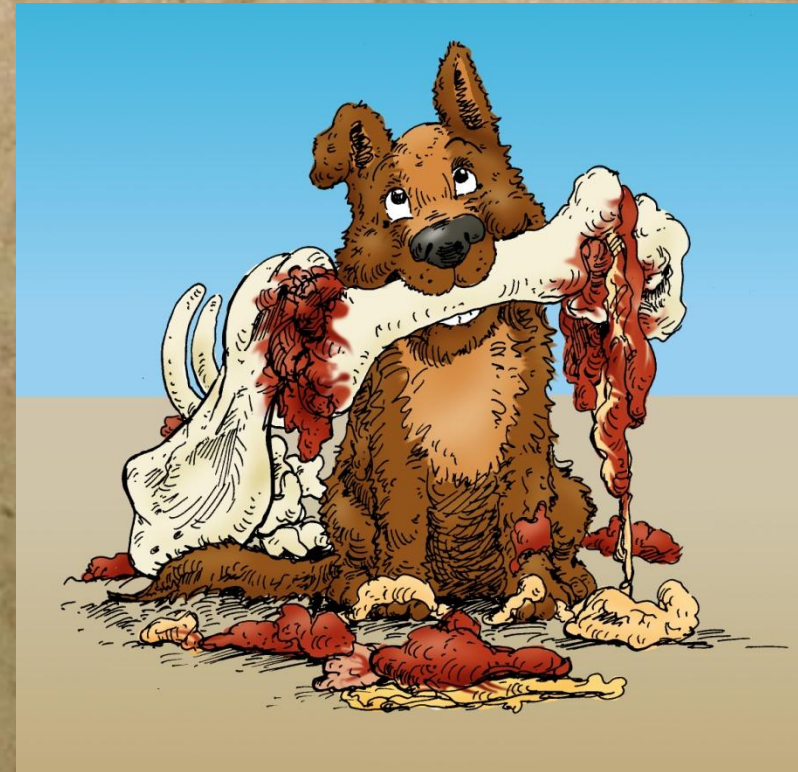


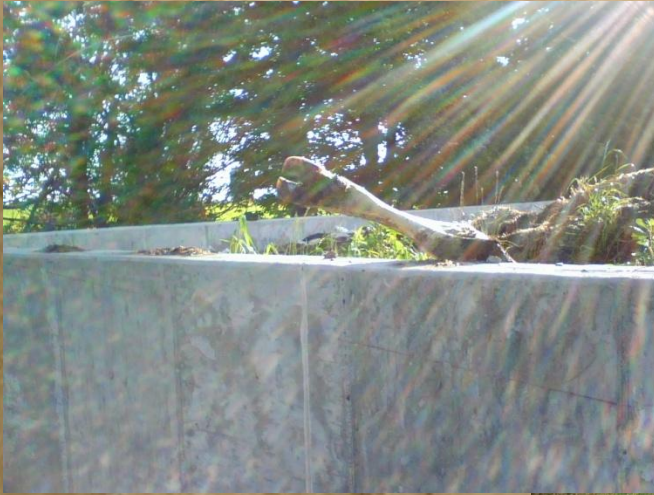
# Mortality Disposal and its Implications on Human, Animal and Environmental Health

Jean Bonhotal and Mary Schwarz



# Three Research Projects

## Above Ground Burial



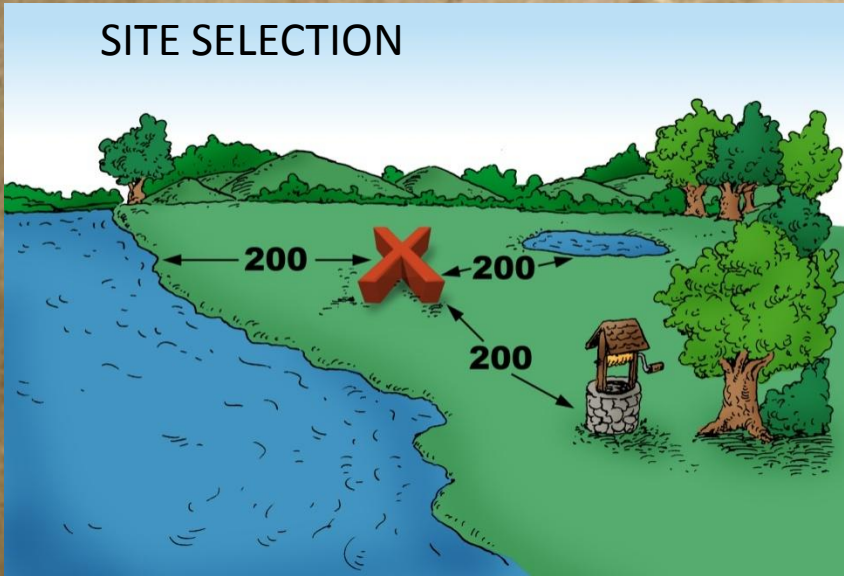
## Leachate Quality during Composting



## Fate of Drugs in Composting



# Composting, Done Properly, is Safe for Humans, Animals and the Environment



Make sure you are not close to wells, streams, water bodies. Check depth to groundwater. Look for plants that indicate wet areas.

Not all carbon sources are created equal.

Carbon sources include: Wood Chips, Shavings, Sawdust, Refused feed, Spoiled Silage, Chopped Cornstalk, Nut Hulls, Partially Composted Material-HOT



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# Mortality Composting Steps

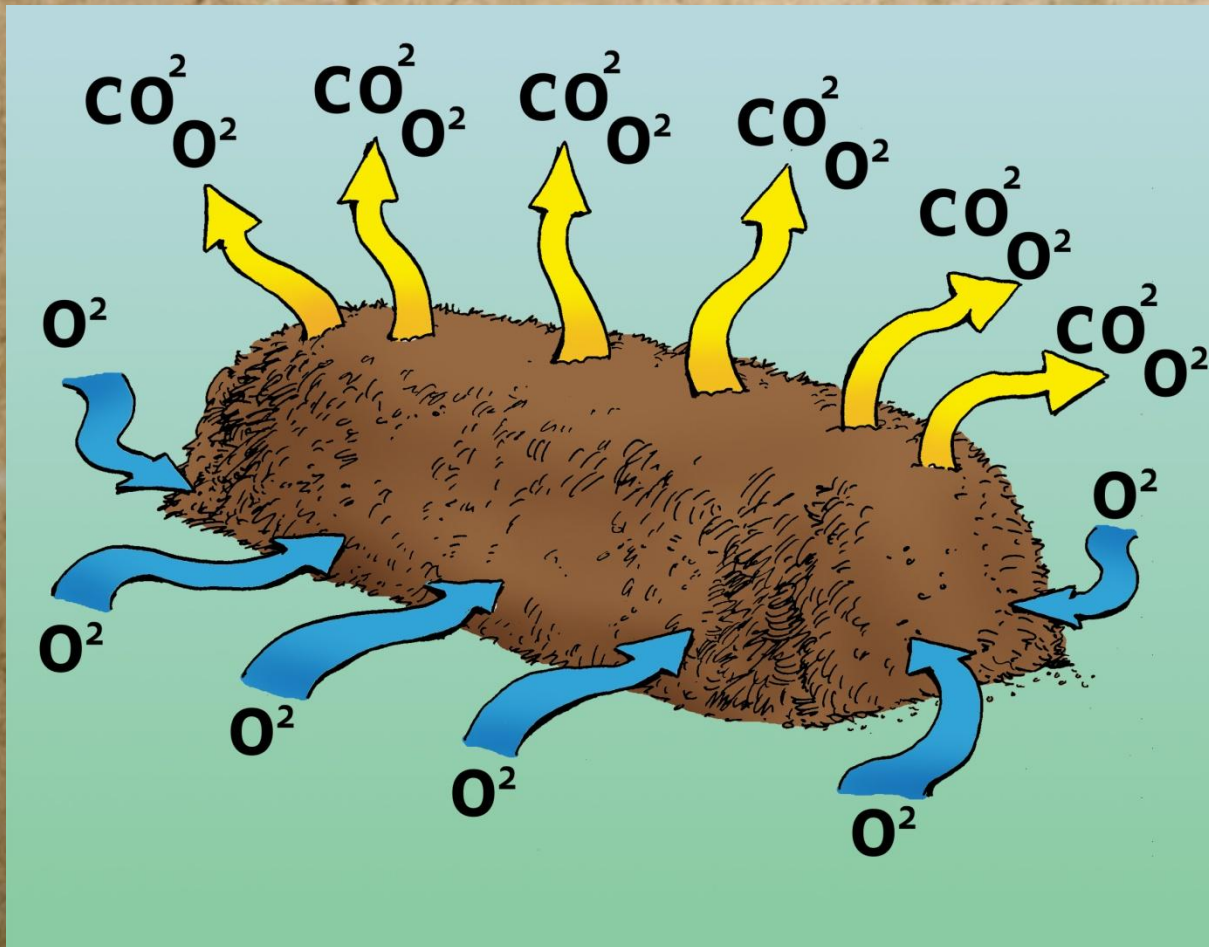
Lay 24-in bed of bulky, absorbing organic material containing some sizeable pieces. Place animal in the center of the bed.



Cover the carcass with dry, high-carbon material.



This method allows for good aeration which creates high temperatures, destroys pathogens and creates a biofilter to alleviate odors.



# Fate of Drugs Study

A 20' x 21' piece of 10 mil plastic sheeting was laid down. A hole was dug at the low end of the pad, under the plastic for leachate/runoff collection.

A 24" bed of wood chips was laid on the plastic.

A 27 year old 1000 lb Appaloosa was injected with 120 ml Fatal Plus at 390 mg/ml Pentobarbital Sodium.



# Fate of Drugs Study

The liver was removed, cut into pieces and put back in the horse for retrieval at various intervals.

A separate 4 foot hole was dug in which liver samples were placed to simulate burial.

Data logger temperature probes were placed in both the compost pile and in the “burial hole” to record hourly temperature.



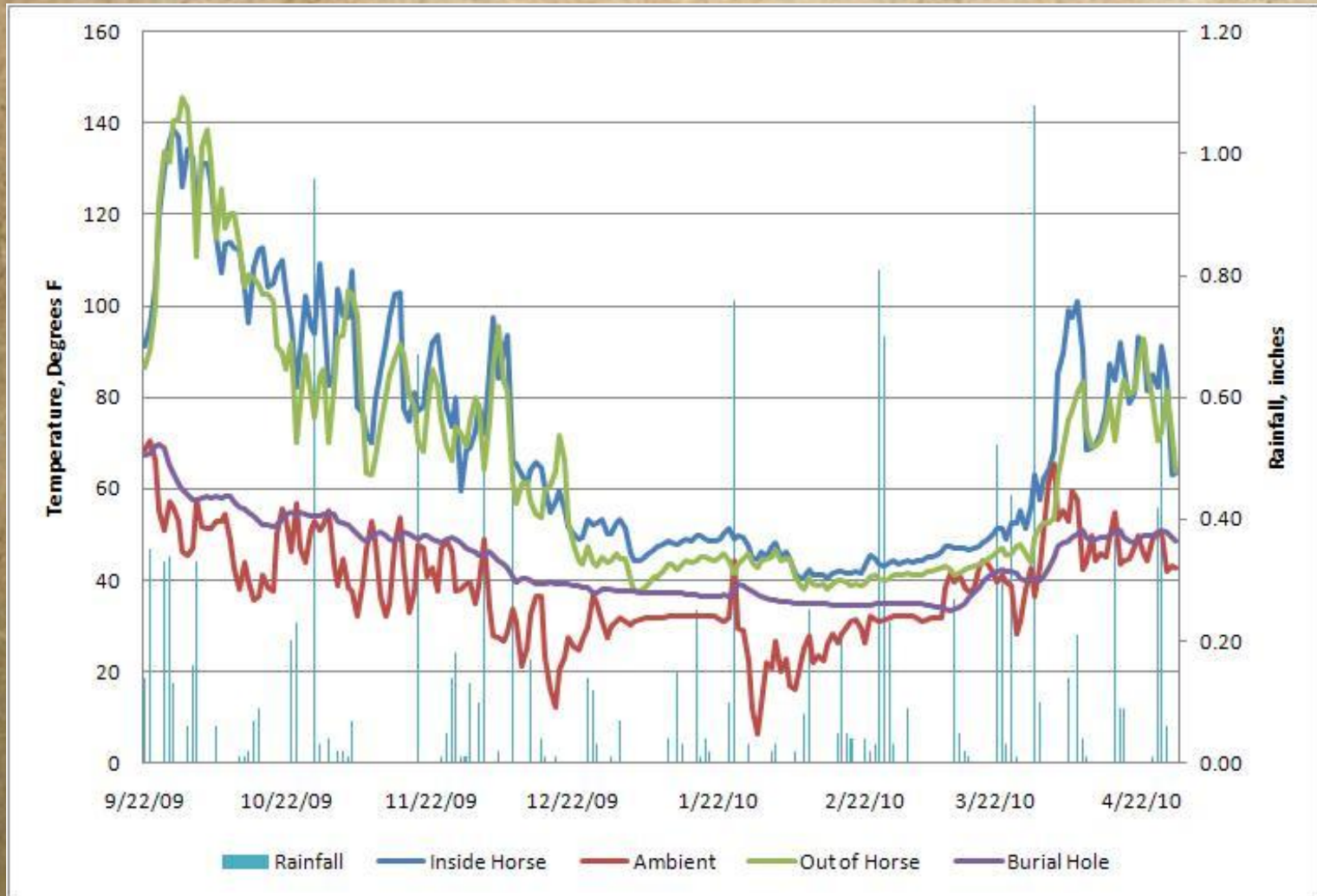
# Fate of Drugs Study

The horse was then covered with 24" of wood chips, and the plastic liner was tightened by rolling it over and under wooden fence posts.

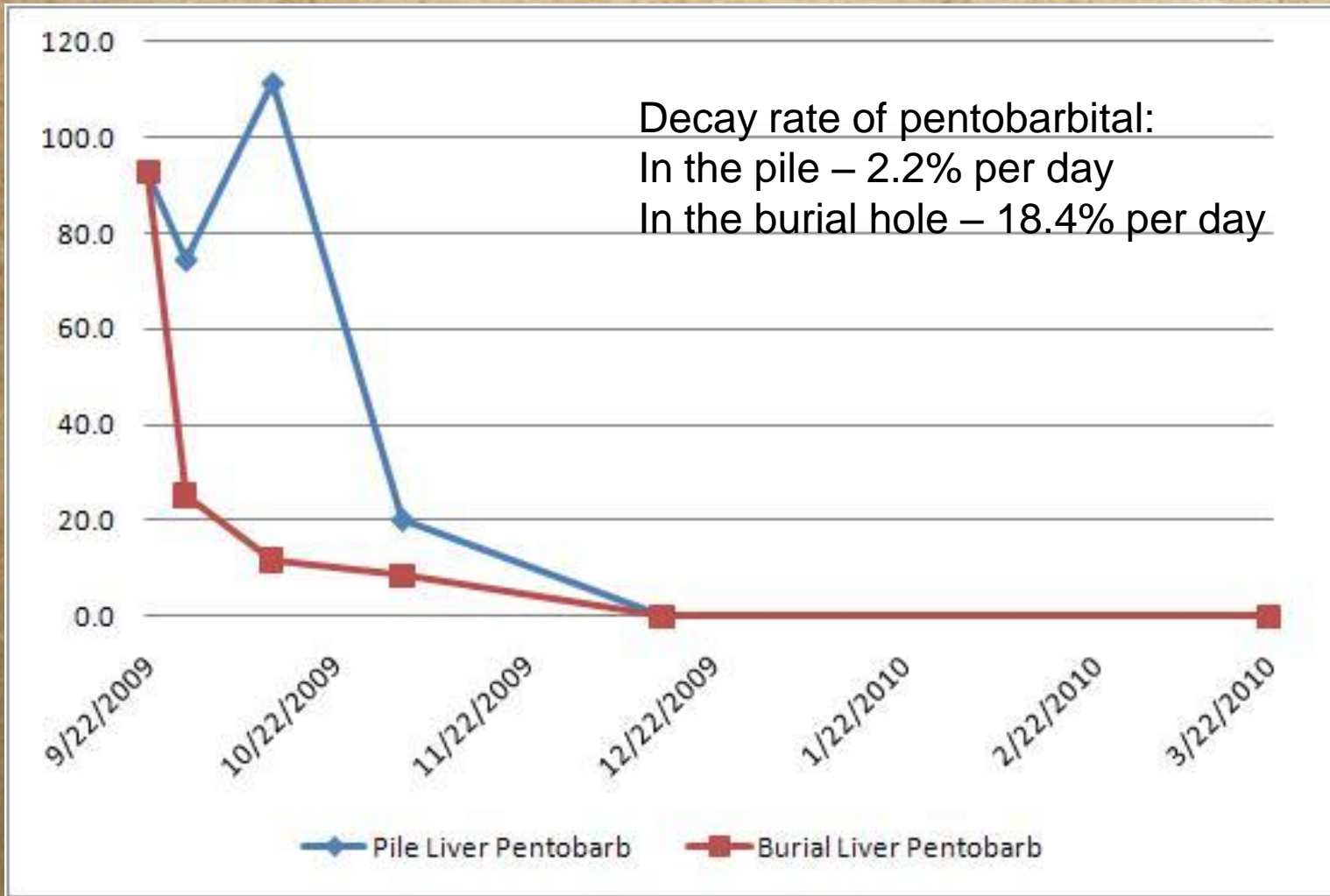




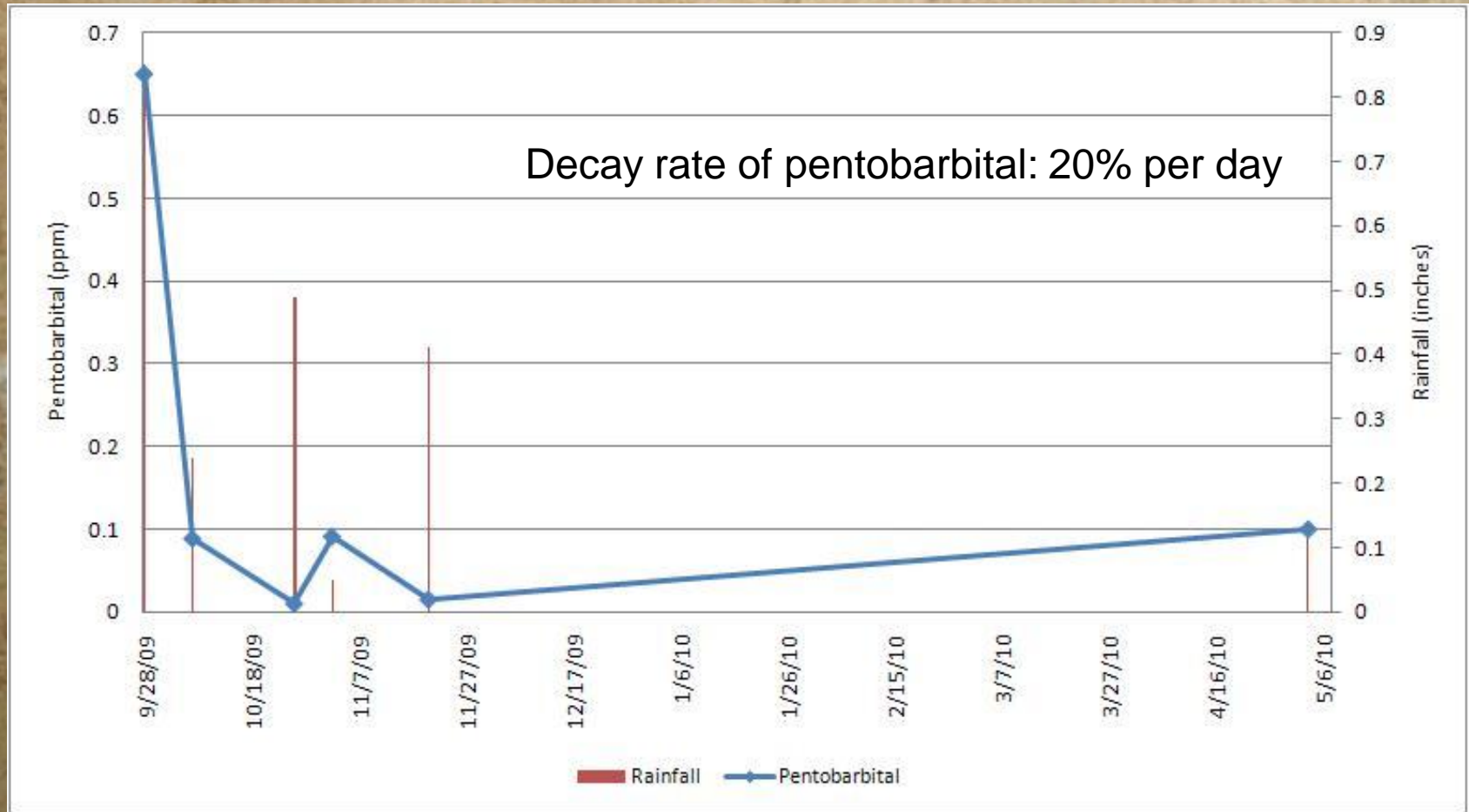
# Temperature and Rainfall



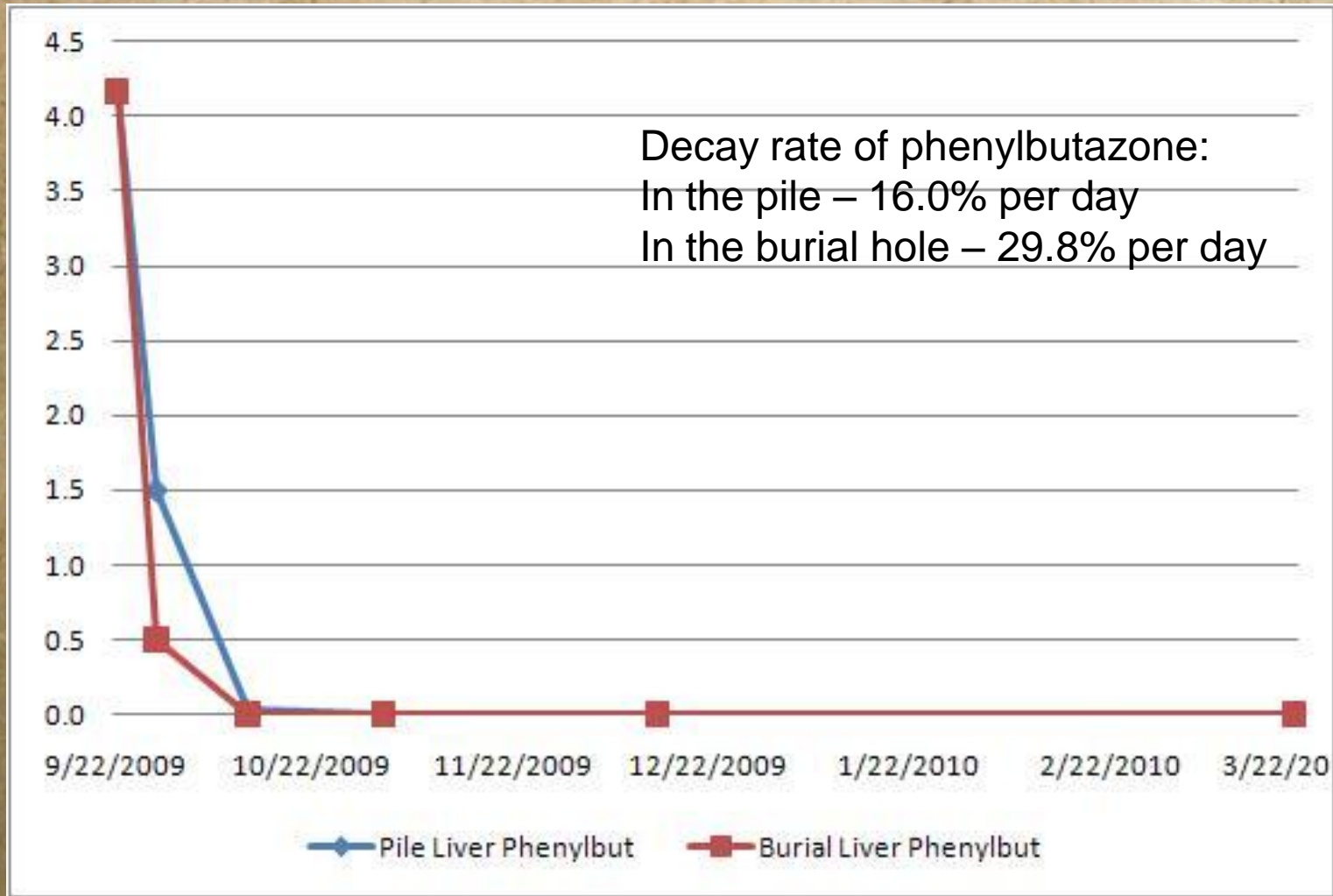
# Pentobarbital (ppm) in Liver Samples



# Pentobarbital in Leachate



# Phenylbutazone (ppb) in Liver Samples



# Results of First Trial

When done properly, mortality composting protects ground and surface water.

Composting of euthanized livestock appears to breakdown both pentobarbital and phenylbutazone. However it may go into soil and appear to persist in compost medium.



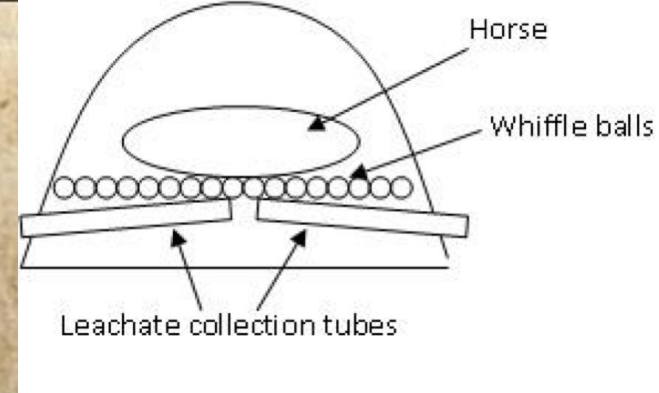
Onto Trial 2

**Horse pile opened after 7 months of composting**



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# Trial 2 Set-up

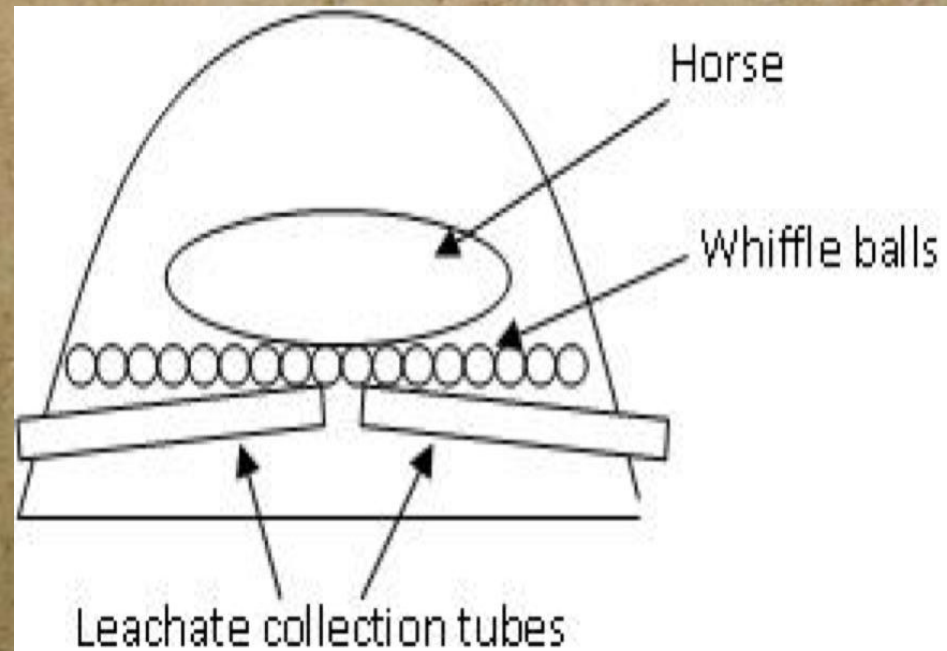


- A 24" bed of wood chips for the base.
- Leachate collection tubes placed: Leachate will be captured in U-shaped PVC plastic troughs of 6" diameter PVC water pipe. Troughs will transfer of leachate into 1-liter polyethylene bottles. Two bottles capture an integrated sample of leachate. Leachate will be measured for pentobarbital concentration as needed.

# Set-up Continued...

- Woodchip-filled balls placed under horse.
- Immediately draw blood analyses = T-0
- Data logger probes (3) under head, middle and feet, and one ambient

. Covered horse 24" of wood chips

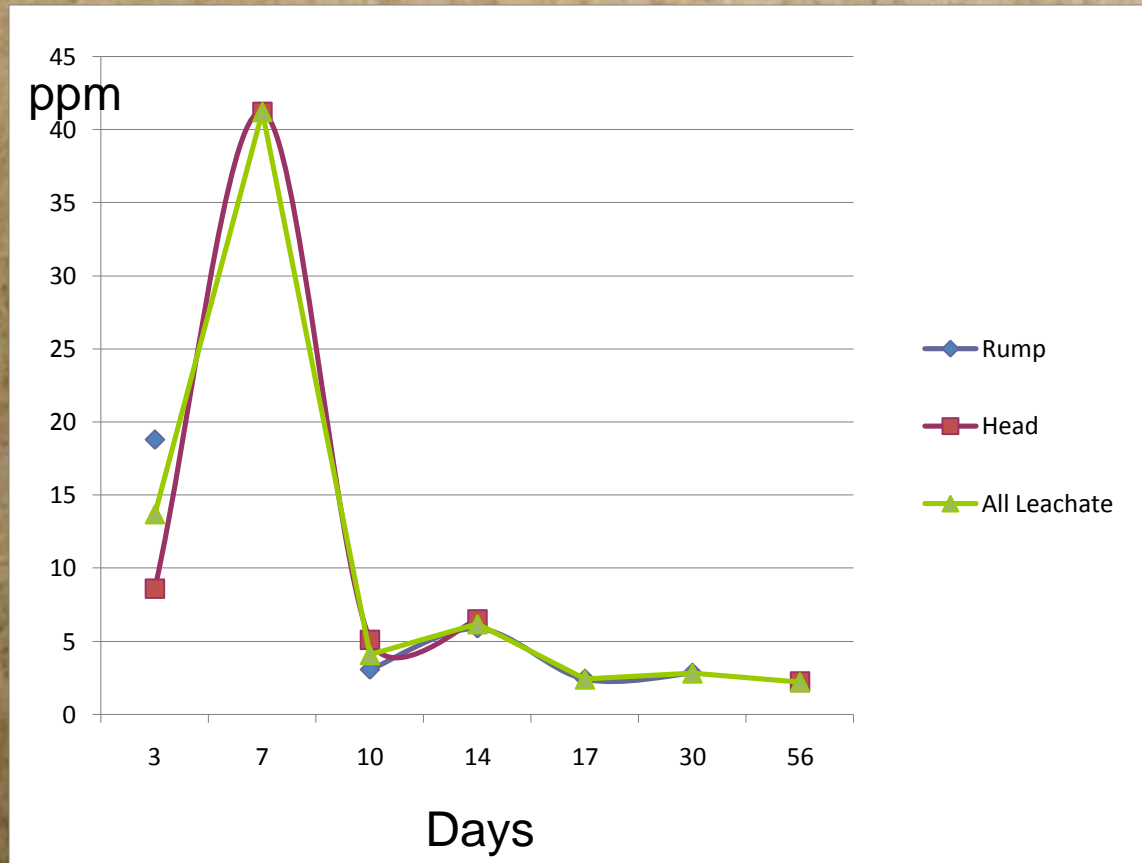


# Pentobarbital Levels in Woodchips





# Pentobarbital Levels in Leachate



## Soil Under Cow Pile

10/5/10 1Cow Day 56--Soil 0.2ppm

2Cow Day 56--Soil 0.21ppm

# Above Ground Burial Study

- Dimensions are 30' wide by 15' deep with 3--54" containment walls
- The pad has a 1% slope to the west wall with four 4" pipes incorporated for draining leachate toward a vegetated filter strip.
- Very little carbon was used, and the containment was packed with carcasses.



# C:N Ratio, Number of Animals, Good Cover



# Run-Off from Above Ground Burial



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# Next season when Using it Correctly???



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# Leachate Quality Assessment Study

2- 15' x 8' rectangles were marked out; holes were drilled at the point of collection and 5-gallon buckets lined with garbage bags were placed in each hole.

Plots were curbed with wooden and steel beams that were 6" tall.

Heavy 6 mil black plastic was used to line the plots.

24" base layer of woodchips was laid in each of the plots



# Leachate Quality Assessment Study

Two deer were placed on the woodchips as the first layer in the plot on the west end. The plot on the east end was “woodchips only”.

Data logger temperature probes were placed in both piles.



Riverhead, NY – Blue and Green funding

12” of woodchips were laid on top to cover the first deer layer

2 more deer were placed in the 2<sup>nd</sup> layer in the road-kill pile.

Both piles were covered with an additional 24” of woodchips.





# Leachate Quality Results: Above Ground Burial

Date	TKN (mg/l)	NH4-N (mg/l)	P (mg/l)	BOD (mg/l)	TOC (mg/l)
06/02/08	3,300	1,100	70	4,700	7,700
09/29/08	640		52	930	4,600
10/02/08	6,000	4,200	440	21,000	740
11/12/08	3,000	1,800	92	3,500	8,100

Date	pH	NO3-N (mg/l)	Chloride (mg/l)	Fecal Coliform (log10 cfu/ml)
06/02/08	7.9	3.8	1,900	3.0
09/29/08	8.4	15.0	2,300	< 2.0
10/02/08	6.4	31.0	710	> 3.0
11/12/08	8.3	16.6	2,000	< 2.0



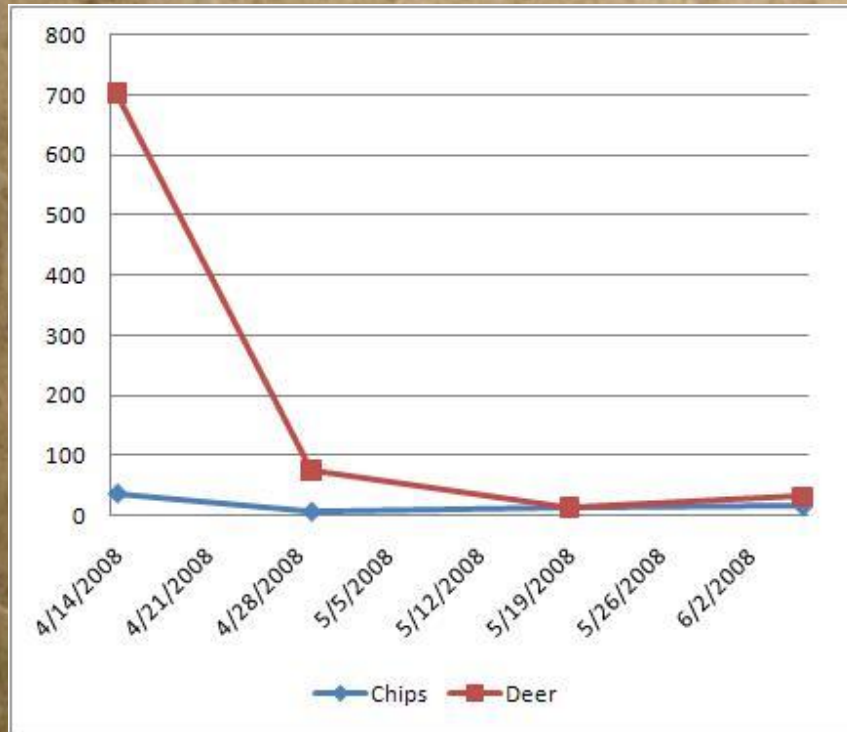
# Leachate Quality Results: Road-kill Compost versus Woodchips Only

Date	TKN (mg/l)		NH4-N (mg/l)		P (mg/l)		BOD (mg/l)		TOC (mg/l)	
	Deer	Chips	Deer	Chips	Deer	Chips	Deer	Chips	Deer	Chips
04/14/08	703	36	213	11	44	10	4,067	487	1,733	373
04/29/08	75	7	38	1	17	1	333	48	230	36
05/19/08	14	13	3	2	3	2	27	24	95	163
06/06/08	32	16	9	5	6	2	101	47	177	17



# Comparison of Nitrogen (TKN) in Mortality Compost and Above Ground Burial

## Compost



## Above Ground Burial

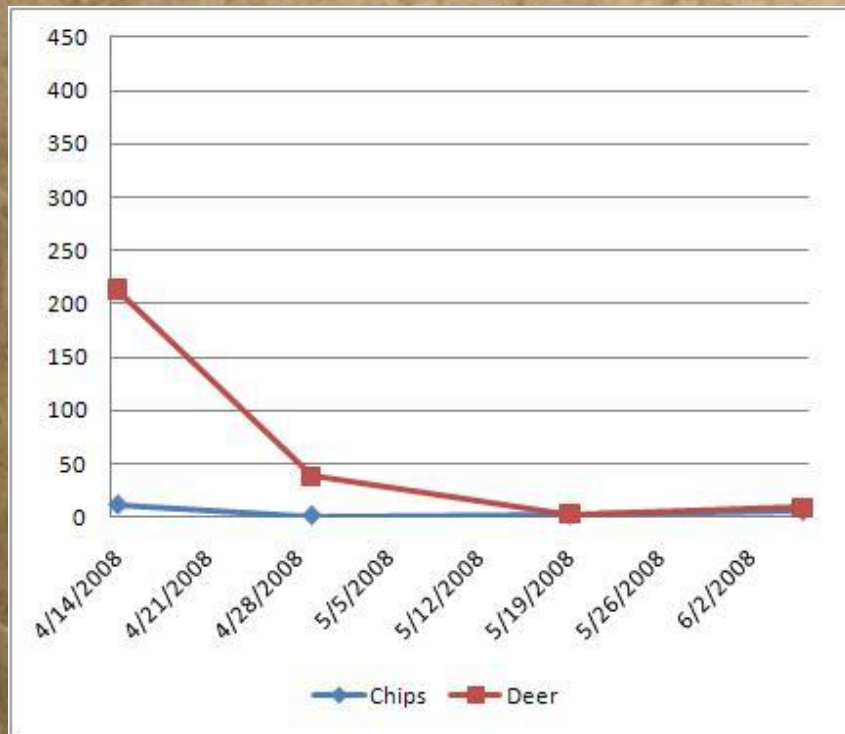


X-axis is 10 times the order of magnitude here versus the compost.

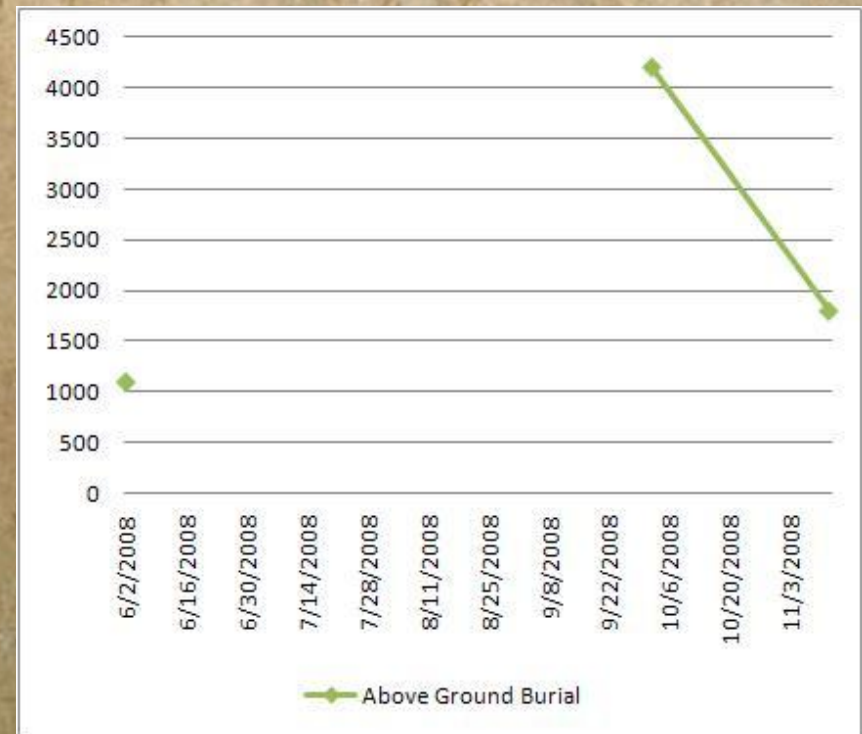


# Comparison of Ammonia Nitrogen (NH<sub>4</sub>-N) in Mortality Compost and Above Ground Burial

## Compost



## Above Ground Burial

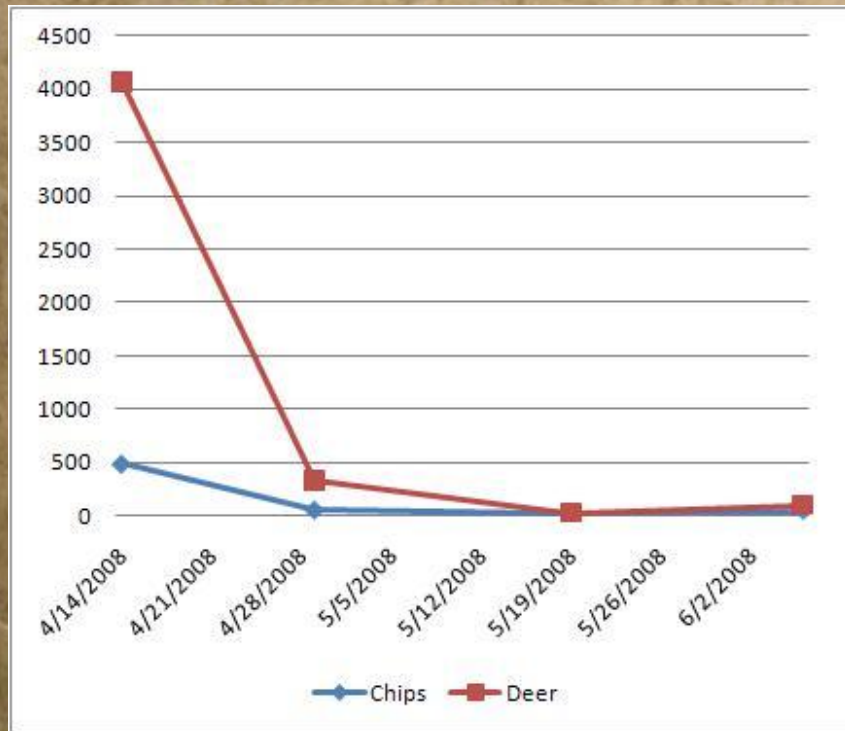


X-axis is 10 times the order of magnitude here versus the compost.

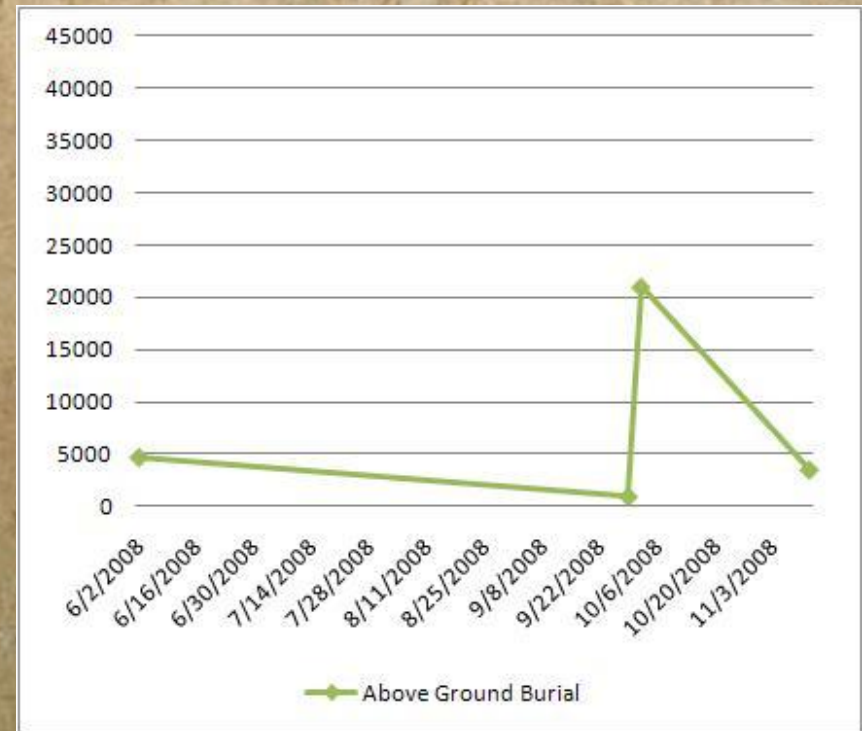


# Comparison of Biological Oxygen Demand (BOD) in Mortality Compost and Above Ground Burial

## Compost



## Above Ground Burial



X-axis is 10 times the order of magnitude here versus the compost.



# Questions?

