Handling Built-Up Litter Between Flocks

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Controlling Ammonia

- Combination of manure, moisture, heat and bacteria
- Cause blindness in young birds over 90 ppm
- Cause decreases in feed efficiency, growth over 50 ppm
- Creates susceptibility to respiratory illness

Objective

- Treat Litter between flocks to reduce pathogen level ammonia production, and caked litter
- Economize litter and ventilation expenses
- Prepare house for next flock

Methods

- In-House Sterilization of litter
- Mechanical Treatment of litter
- Flame Sterilization of litter

In-House Pasteurization of Broiler Litter

Water Quality Issues in Poultry Production and Processing

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Objectives

Our main objectives are to reduce pathogen content in broiler litter and to reduce ammonia levels in poultry houses

*** Determine the optimum moisture content (of broiler litter) necessary for maximum pathogen reduction**

*** Determine the effect of pasteurization on pathogen content in broiler litter**

*** Determine the nutrient content of recycled broiler litter**

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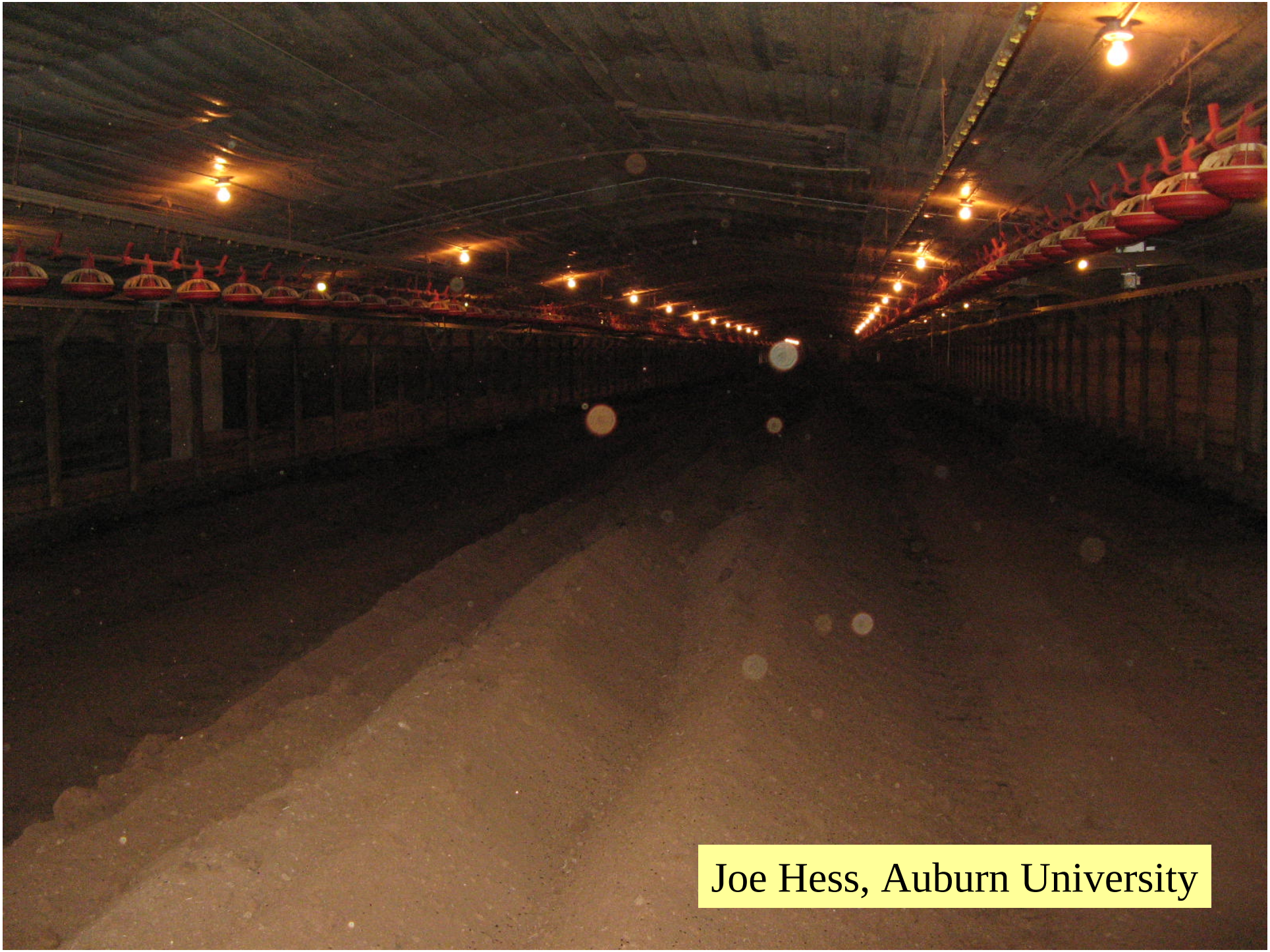
Temperature and Time for Pathogen Destruction

Microbe	Temp(F)	Time (Minutes)
Salmonella typhosa	131	30
Salmonella sp.	131	60
Shigella sp.	131	60
Entamoeba histolytica cysts	113	2-3
Tanea	131	2-3
Trichinella spiralis larvae	131	2-3
Brucella abortis	145	3
Micrococcus pyogenes	122	10
Streptococcus pyogenes	131	10
Corynebacterium diptheria	131	45
Necator americanus	113	50
Escherichia coli	131	60

Procedures

Poultry litter is arranged into two windrows running lengthwise of the house

Joe Hess, Auburn University


Joe Hess, Auburn University

Procedures

If needed, water is added to the litter to obtain the desired moisture content

Procedures

Windrows are monitored for 7 to 10 days

Thermometer stations record temperatures at 6” and 12” depths


21
22

Temperature and Moisture

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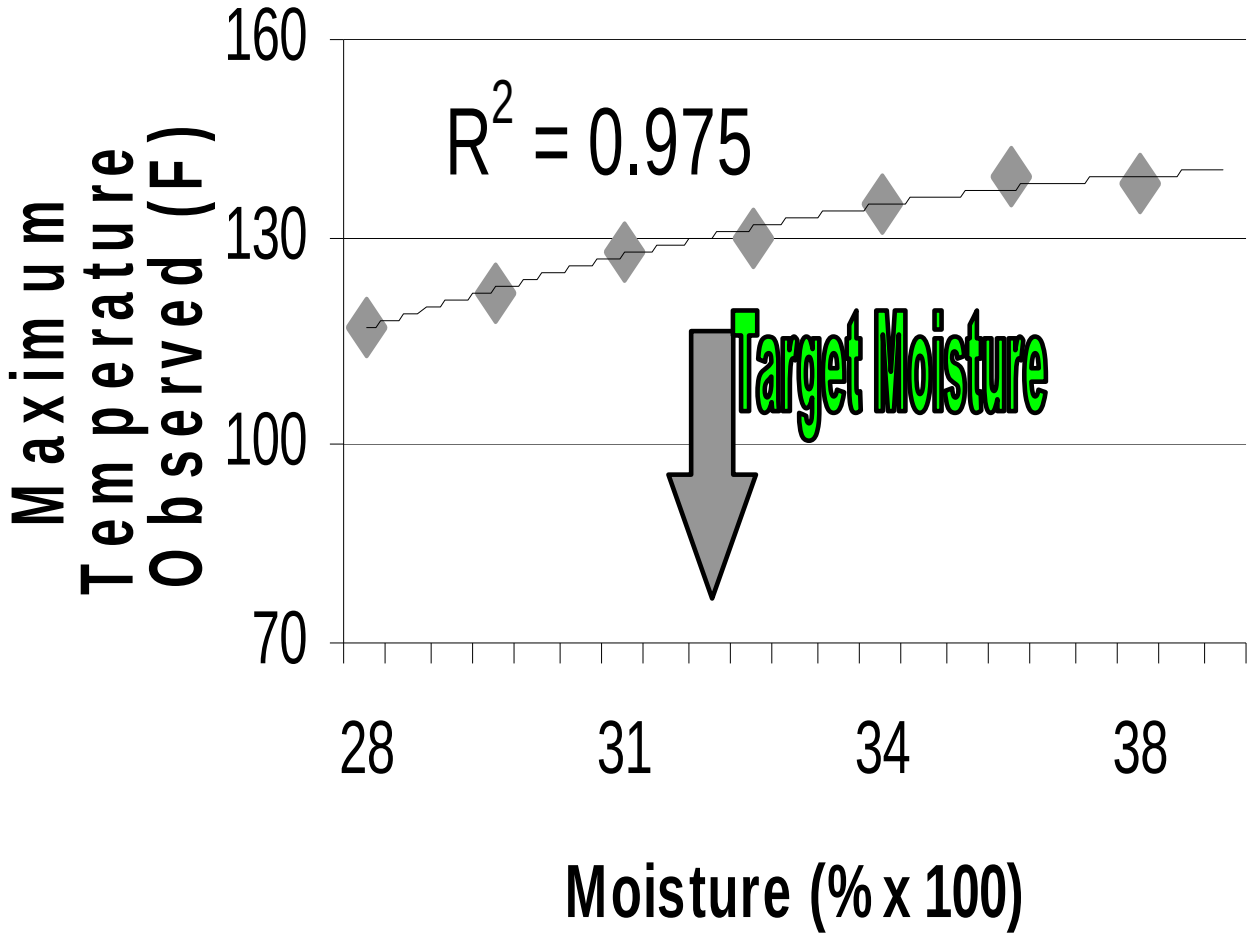
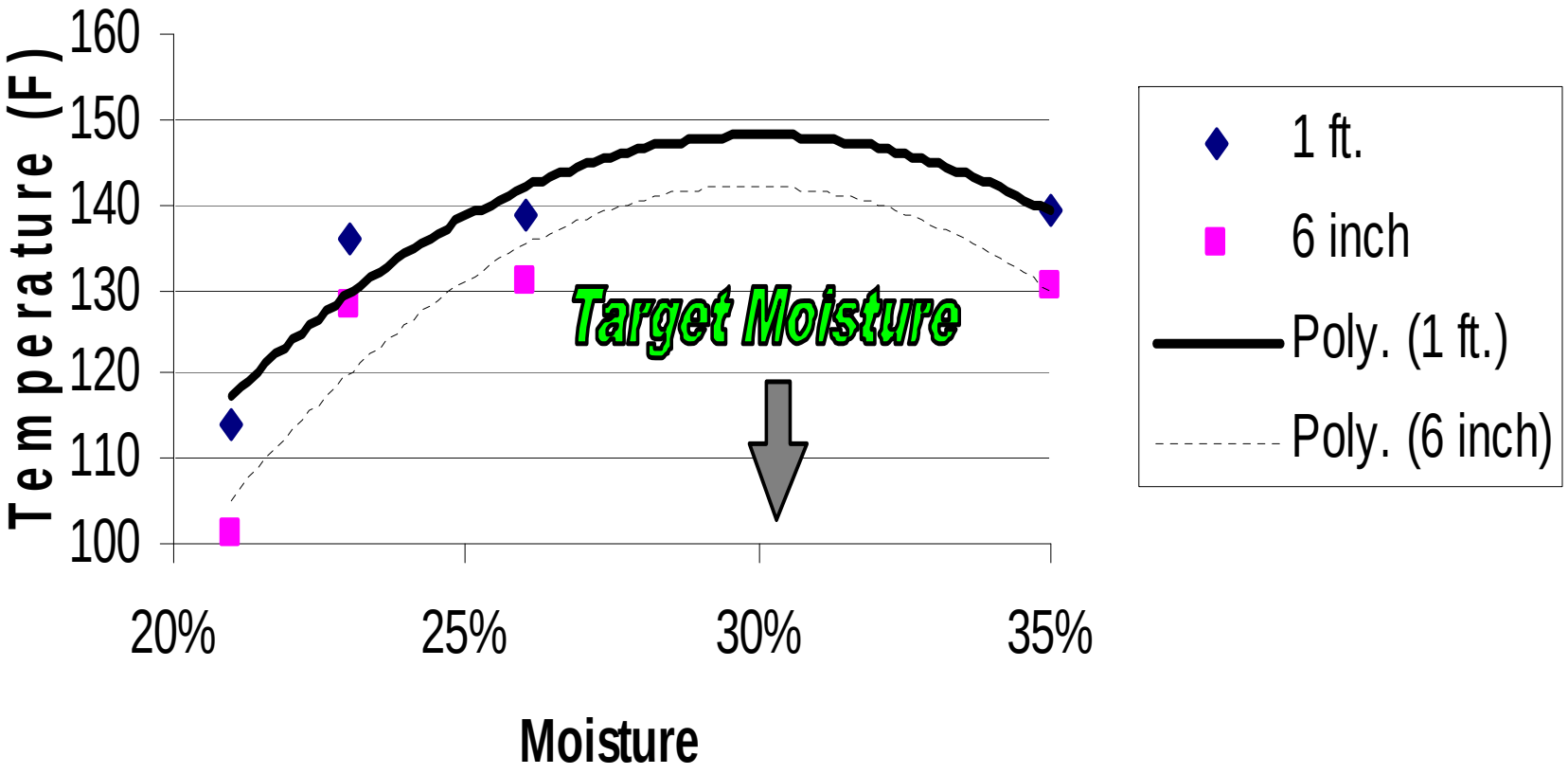
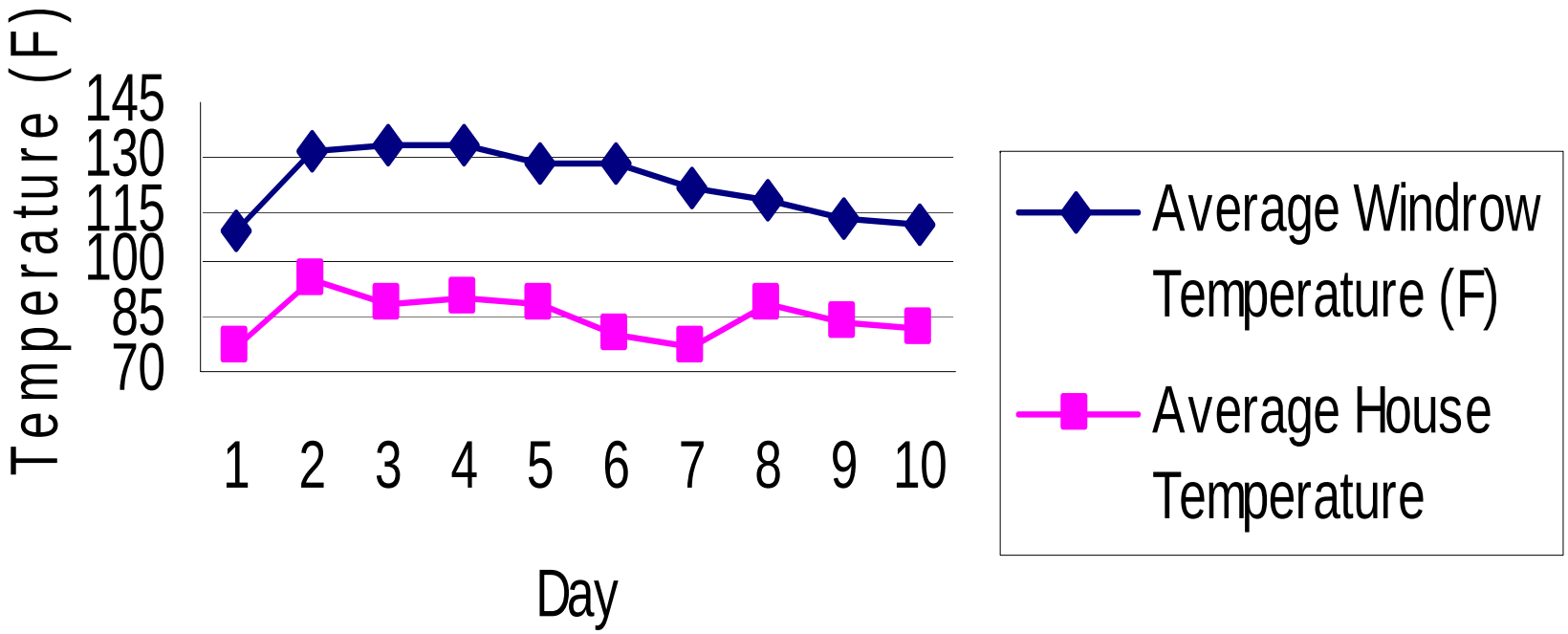
Maximum Temperature vs. Moisture in Dewar Flasks

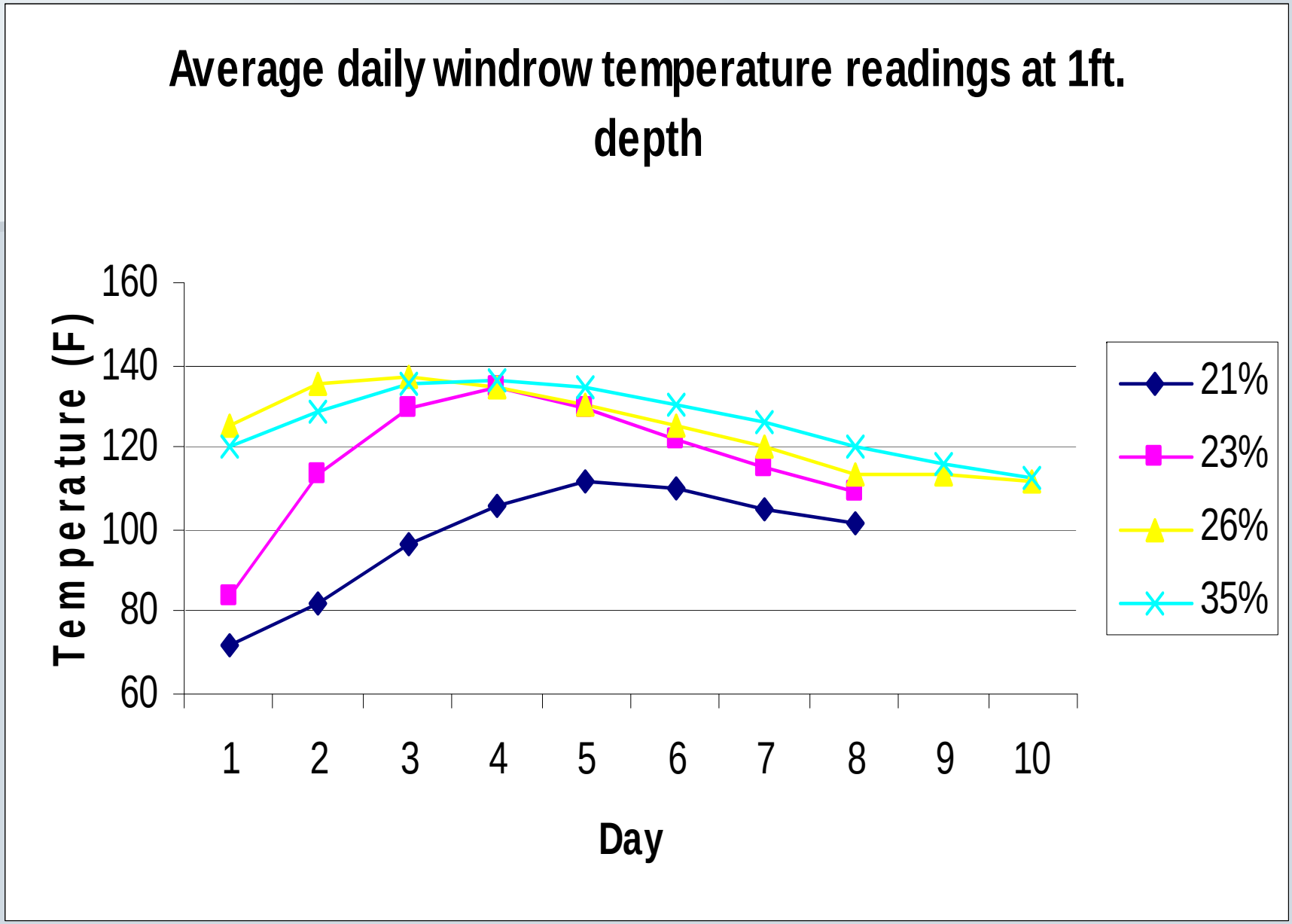


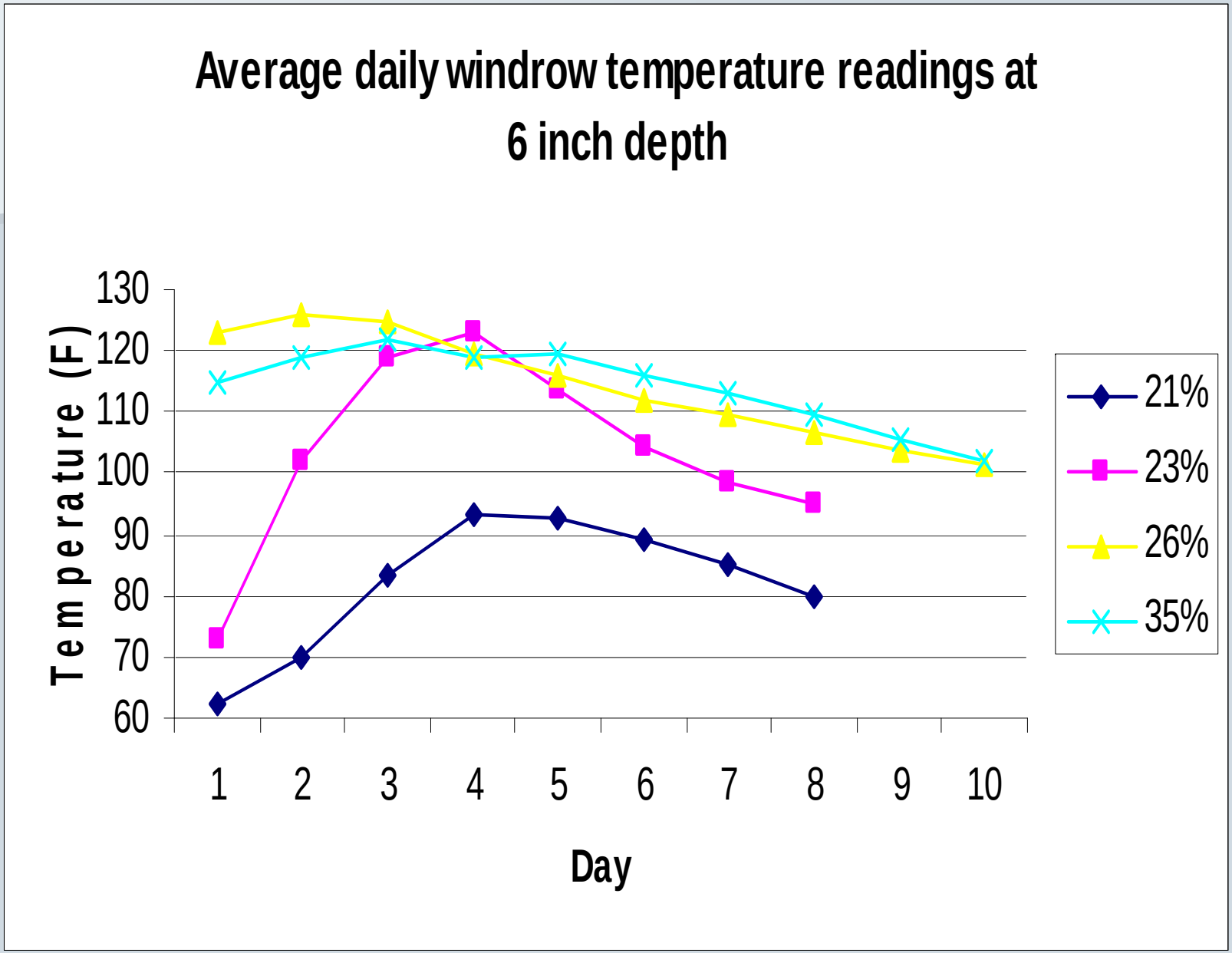
Maximum average temperatures at 1 ft. and 6 inch depths at various moisture contents



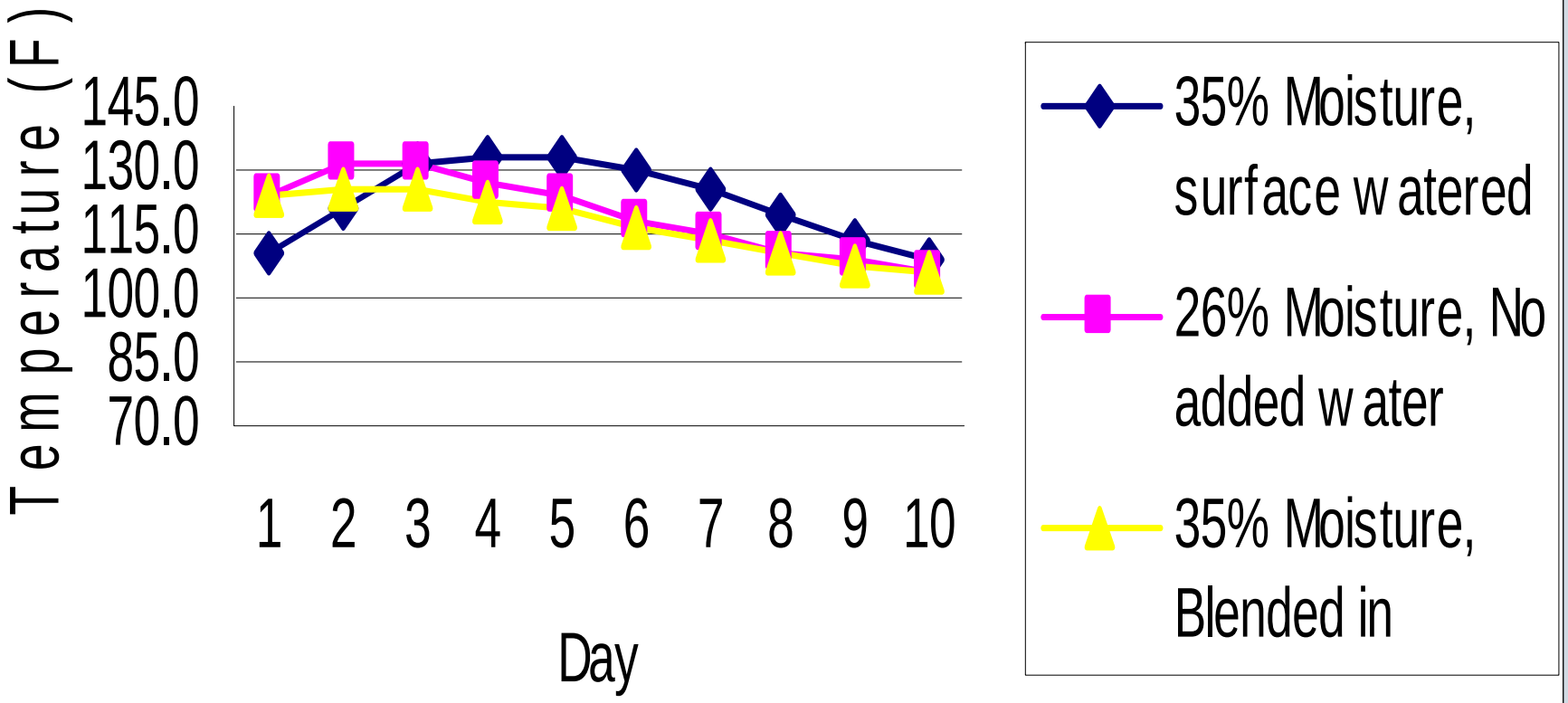
Average windrow and house temperatures during 10 days of in-house pasteurization of poultry litter at 28% moisture.




Average daily windrow temperature readings at 1ft. depth
Temperature (F)
160
140
120
100
80
60
1
2
3
4
5
6
7
8
9
10
Day
21%
23%
26%
35%


Average daily windrow temperature readings at 6 inch depth
Temperature (F)
130
120
110
100
90
80
70
60
1
2
3
4
5
6
7
8
9
10
Day
21%
23%
26%
35%

Average daily windrow temperatures during 10 days of in-house pasteurization of poultry litter at various moisture levels



Sampling

Litter samples are taken "before" and "after" the pasteurization process

- **Pathogens**
- **Nutrients**

Sampling

Preliminary laboratory results indicate that there is a reduction in broiler litter pathogen levels following in-house pasteurization

Chemical Litter Treatments

- Acidifying agents to reduce ammonia production
- Decrease moisture from litter
- Apply “positive” bacteria to competitively provide good environment for birds
- Apply enzymes or other compounds to bind up ammonia compounds and prevent release

Lewis Brothers Manufacturing, Housekeeper

- Litter Treatment
  - De-caking and conditioning machines
  - Remove moisture-laden, ammonia producing manure
  - Mixes and aerates litter material
  - Video

Red Dragon, Flame Engineering

- Litter Sterilizer
  - **Designed to treat bare floors and litter after flock removal and de-caking.**
  - **Six Liquid Propane torches that put intense heat under a sturdy enclosed steel hood.**
  - **Produces heat over 2000F and maintains approximately 1400 F which kills pathogens, insects and insect larvae or eggs.**
  - **Video**

Summary for Litter Treatment

- In-house sterilization
- Chemical treatment
- Mechanical treatment
- Flame treatment