



Poultry Stress Management

—by Stephanie Bowen

THE MESONET PROVIDES VITAL products to help Oklahoma poultry producers monitor specific weather data. High temperatures, humidity and dewpoint can all have a negative effect on bird performance. Luckily, evaporative cooling systems in tunnel ventilated broiler houses help with this problem.

“Things have changed over the last ten years,” said Brian Freking, OSU Southeast Area Extension Livestock Specialist. “Twenty years ago, one way they cooled the birds down is by keeping track of temperature and humidity. If it was 80 degrees with 80 percent humidity, they would start losing chickens. Now, they have controllers in the chicken houses, and they use a system that is called tunnel ventilation. It is a wind tunnel that pulls in air from an opening and runs the air through wetted cardboard, known as evaporative cooling. So wind speed is important as well. The most efficient system can drop temperatures 20 degrees.”

Freking says it is also important to monitor dewpoint because poultry houses need to stay dry inside. The Mesonet’s Temperature/RH/Dewpoint Graph is a great tool to monitor all three weather variables.

“Poultry growers can use your (the Mesonet’s) tool to figure

how long they need to run their fans,” Freking said. “This helps to avoid the deadly combination of heat and humidity.”

Weather data is very important to help determine the need and type of evaporative cooling system to use in an area. The most crucial weather factors that help determine the need for evaporative cooling systems is prevailing high temperatures with high relative humidity.

The Mesonet’s Temperature/RH/Dewpoint Graph is used in multiple areas in the agriculture industry. For example, it is used during hay baling season. These variables impact the hay’s moisture content which is important to successfully bale, and it impacts the hay’s value as well. To view this graph, visit www.mesonet.org, and click on ‘Agriculture’ in the top menu. Then select one of the following from the sub-menu:

- ▶ Crop - Grass Hay or Alfalfa
- ▶ Livestock - Poultry
- ▶ Rangel/Forest - Rangeland or Forestry

According to Jim Donald, P.E., Professor and Extension Engineer at Auburn University, “The goal of evaporative cooling in a tunnel house is to get inside air temperature down to the range (80°-84°F) where wind-chill cooling can keep birds comfortable. The relative humidity of air determines the theoretical cooling potential available. The most critical weather factor in making evaporative cooling system decisions is how hot it gets for how long, and what

the relative humidity tends to be at these times. The higher the temperature and the lower the relative humidity, the more need for cooling and the more effective evaporative cooling can be.”

Freking added, “The best thing about the Mesonet is all the houses have to be designed based on local weather, so the engineers rely on your products heavily.” ■

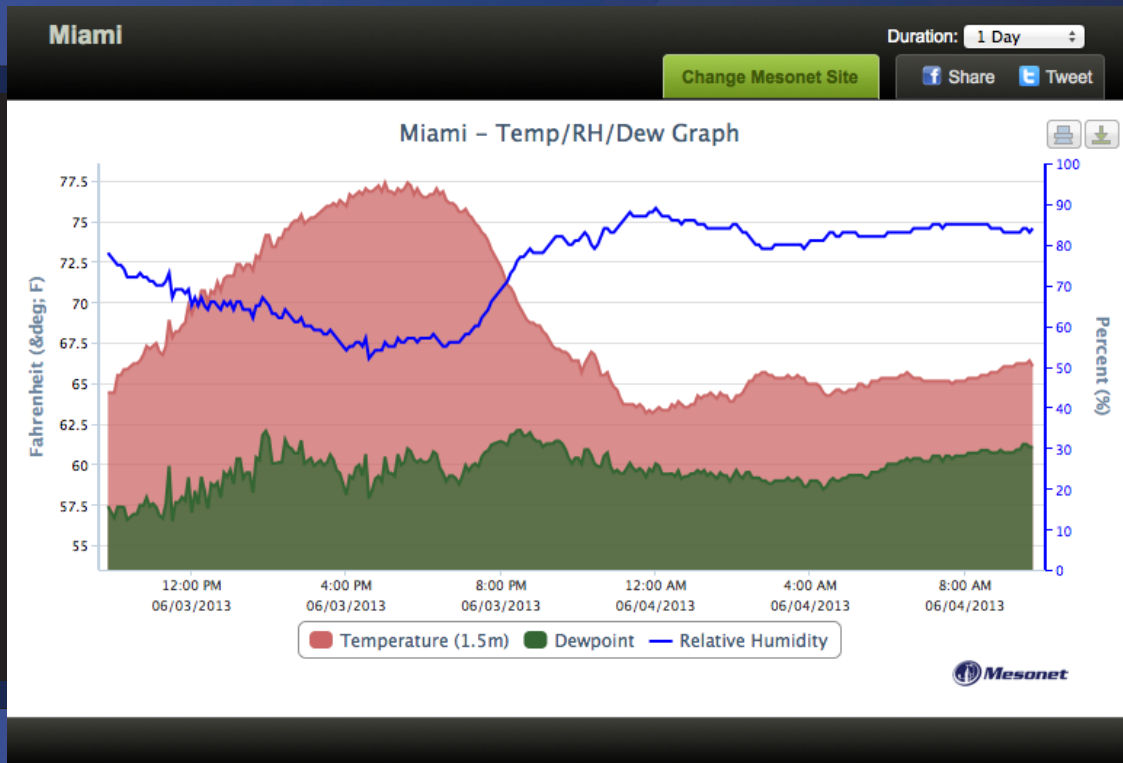
This particular research house at The University of Georgia Poultry Research Farm consists of two 100’ X 40’ environmentally controlled rooms. Exhaust fans are located in the end walls and a series of “european style” air inlets are located along each side wall. Evaporative cooling pads are located in a plenum wall located approximately 2’ from the building side wall. The plenum wall provides both cooling of the incoming air as well as light control.



MESONET IN PICTURES

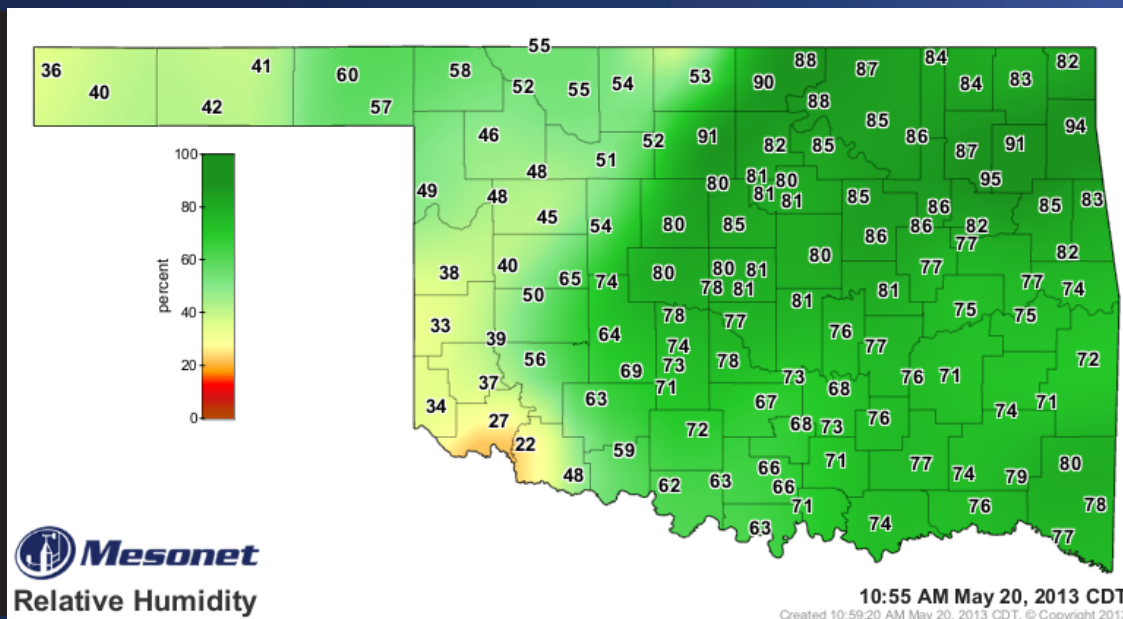
Temp/RH/Dew Graph

- The graph displays temperature, dewpoint and humidity over a selected duration (6 hours-1 week available). By clicking and dragging over a time frame, you can zoom in to the graph. This graph is helpful for poultry producers, as well as other entities in the agricultural industry. Visit www.mesonet.org and select 'Agriculture'. Then click 'Livestock' from the sub-menu and 'Poultry' from the drop down menu.



Relative Humidity

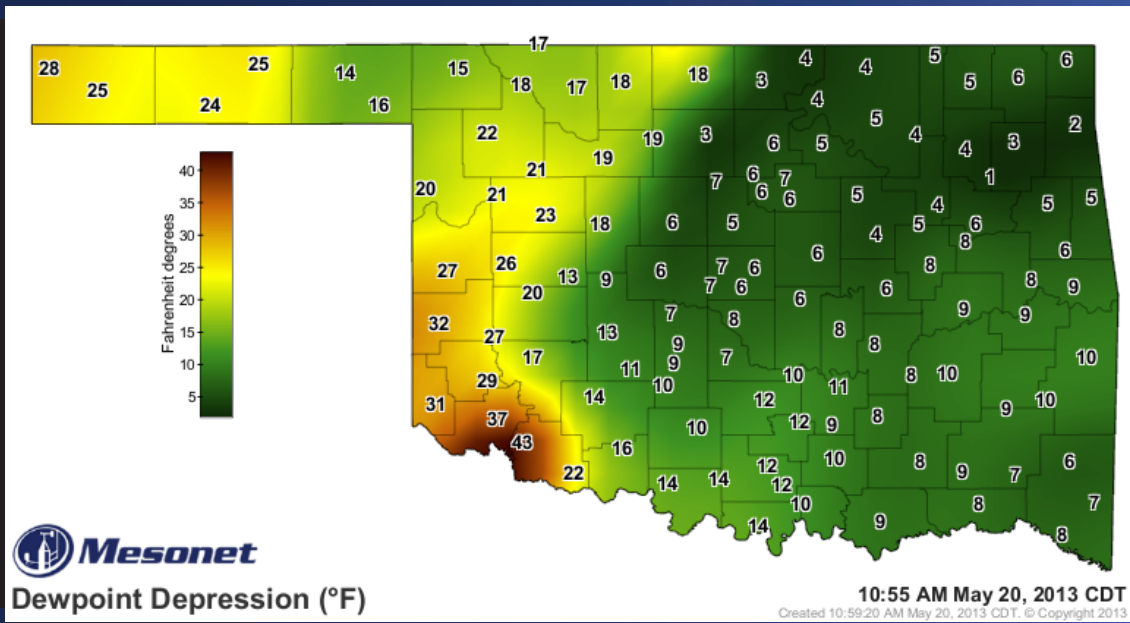
- The Relative Humidity map displays the current relative humidity (in percent) at each Mesonet site. Relative Humidity is the measure of the water vapor content of the air at a given temperature. To view this map, visit www.mesonet.org, click on 'Weather' in the top menu, then select 'Dewpoint & Humidity' from the side menu.



MESONET IN PICTURES

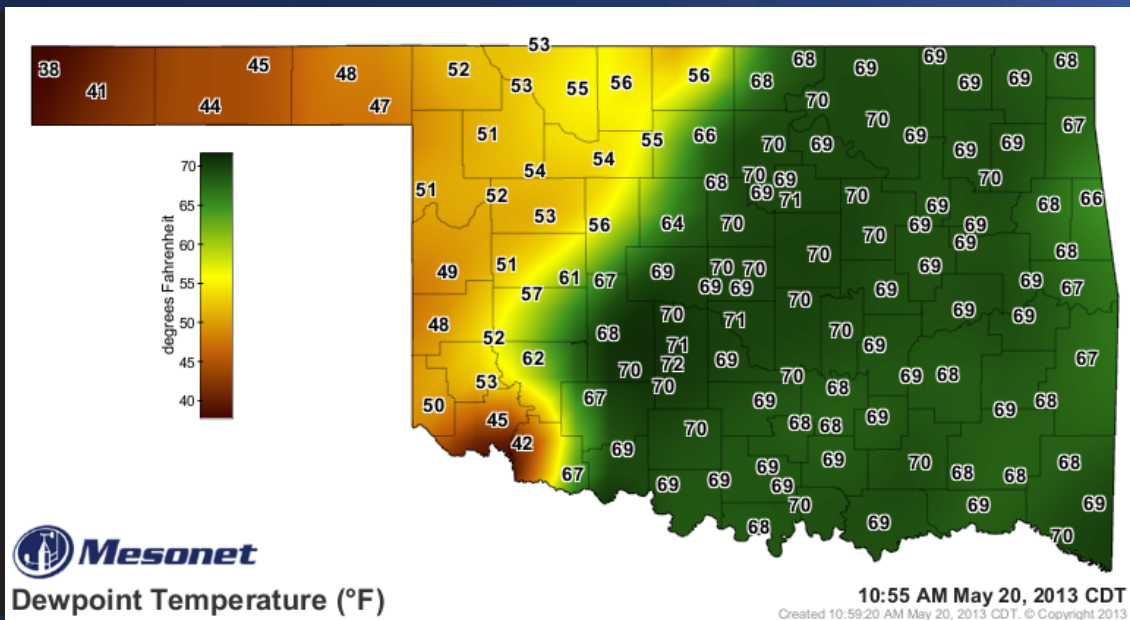
Dewpoint Depression

- The Dewpoint Depression map displays the difference (degrees Fahrenheit) between the air temperature and the dewpoint temperature. To view this map, visit www.mesonet.org, click on 'Weather' in the top menu, then select 'Dewpoint & Humidity' from the side menu.



Dewpoint Temperature

- The Dewpoint Temperature map displays the current dewpoint temperature (degrees F) observed at each Mesonet site. Dewpoint is the temperature to which air must be cooled for saturation to occur (given a constant pressure and water vapor content). To view this map, visit www.mesonet.org, click on 'Weather' in the top menu, then select 'Dewpoint & Humidity' from the side menu.



Wringing Over the Ring

—by Kevin Kloesel

IF YOUR PARENTS WERE LIKE MINE, you learned about the effects of dew point temperature at an early age. “Get a napkin! Get a coaster!” It seemed as if every time I had an ice-cold sports drink after baseball practice, my mom was swooping in to put something absorbent underneath it. Every time I lifted the beverage to take a drink, there was that ever-present ring of water on the napkin. Mom would always add, “Don’t spill it!” No matter how many times I denied spilling my drink, mom would point at the incriminating napkin. Yelling back “I didn’t do it!” was not worth having a bar of soap for supper. I believe my passion for meteorology was born out of trying to investigate the ethereal causes of that mysterious ring of water. What was causing liquid water to form on the outside of the glass? And why did it only occur on certain days?

Water in our atmosphere can exist in all three phases: invisible water vapor, liquid water, and ice. We are familiar with the temperature that is the demarcation between liquid and ice. We call that the freezing point (or melting point). But what about the temperature where water vapor turns into liquid? And, is that a constant temperature like our 32°F freezing point?

The dew point temperature is the temperature at which invisible water vapor in the atmosphere begins turning into visible liquid (‘at constant pressure’ for the meteorologist that might be reading this). The dew point temperature is different on any given day depending upon how much water vapor is in the atmosphere. On summer days that feel really sticky and humid, the dew point is usually high, sometimes

even in the 70°F range. These are the days when southerly winds bring moisture from the Gulf of Mexico. If you place a cold drink outside on a 70°F dew point day, water vapor will begin condensing into liquid on the outside of the glass almost immediately. In the winter, cold dry air from the north usually brings very low dew points, sometimes dew points below 0°F. You will not have any condensation on the outside of a drinking glass when the dew point is very low. I love low dew points! I never got in trouble for not using a napkin in low dew point conditions!

The dew point temperature is one of the most important parameters for weather forecasters in predicting the formation of clouds, rain and storms. It is also used to determine of relative humidity, an important factor in forecasting fire weather conditions. Most recently, the National Weather Service used maps of Oklahoma Mesonet dew point temperatures to locate the exact position of the famed Oklahoma “dry line.” The dry line is a boundary that separates air with very low dew points from air having high dew points. Oklahoma Mesonet dew point maps were critical for forecasting the location of devastating Oklahoma tornados on May 19, 20, and 31.

The next time you have an ice cold drink, watch the outside of the glass very carefully. The temperature at which the invisible atmospheric water vapor turns into liquid on the outside of the glass is the dew point temperature. And, knowing the dew point temperature is key for understanding and forecasting our volatile Oklahoma weather. ■





A May to Remember

By Gary McManus, Associate State Climatologist

MAY WRAP-UP

In a state so accustomed to highly variable and often tumultuous weather, May 2013 will be long remembered as one of its most notorious. The month began with some of the coldest late-spring weather in the state's history and finished with a flourish of violent weather, including one of Oklahoma's worst tornado disasters on record. Stirring the echoes of May 3, 1999, for many central Oklahoma residents, a massive and violent tornado churned its path of destruction from near Newcastle through south Oklahoma City and Moore before dissipating near Stanley Draper Lake. The tornado reached EF5 level, the strongest category on the Enhanced Fujita Scale. The tornado had winds estimated at over 200 mph and reached a maximum damage width of 1.3 miles along its 17 mile, 40 minute path. One day previous to that event, a violent twister traveled from east Norman to near McLoud. That tornado was rated as an EF4. While numbers are still preliminary, the National Weather Service counted at least 19 tornadoes between the two days. Officials from the Oklahoma Department of Emergency Management estimated that the two-day barrage impacted 2937 homes, businesses and non-residential buildings. The severe weather was far from over, unfortunately. May's final three days saw a flurry of dangerous weather, culminating on its final day. A large tornadic supercell spawned several tornadoes from El Reno to Moore to southeast Oklahoma City. A preliminary count of nine fatalities from those tornadoes, including two children, brought the year's tally to at least 35. That ties 2013 with 1960 as Oklahoma's second deadliest tornado year since 1950, bested only by 1999's 42 fatalities.

May saw a continuation of the cool weather and drought relief the state has experienced since mid-February, although western Oklahoma and the Panhandle remained parched. According to preliminary data from the Oklahoma Mesonet, the statewide average temperature finished at 66.8 degrees, more than a degree below normal. May was the fourth consecutive month to finish with below normal temperatures. The below normal finish was mainly due to a cool first half of the month. A freeze occurred across western and northern Oklahoma as late as May 3. Up to 2 inches of snow fell across northeastern Oklahoma on that day, the latest snowfall on record for many locations. Tulsa recorded its first ever May snowfall with a trace on May 2. The climatological spring season of March-May finished with a statewide average temperature of 56.2 degrees, nearly 3 degrees below normal, to rank as the 11th coolest on record.

The precipitation totals across the state only added to the month's tarnished legacy. The Mesonet site at Hooker in Texas County recorded a measly 0.08 inches of rain for the month, the second lowest May total for that Panhandle town since records began in 1906, just 0.04 inches behind 1916's 0.04 inches. On the other end of the scale, Oklahoma City experienced its wettest May on record with a whopping 14.52 inches of rain at Will Rogers Airport. That total becomes Oklahoma City's second wettest month on record, eclipsed only by June 1989's 14.66 inches. Combined with March and April, Oklahoma City's spring total balloons to 23.18 inches, besting the previous wettest spring mark of 20.31 inches from 1947.

According to data from the Mesonet, the statewide average rainfall total for May was 4.9 inches, about 0.3 inches below normal. That ranks the month as the 54th wettest since 1895. A band from south central through central and northeastern Oklahoma recorded 9 to 11 inches of rainfall. Most of the western third of the state recorded less than 2 inches, however, with the Panhandle seeing less than a quarter of an inch. Although the spring season had a statewide average at 10.65 inches, about an inch below normal, the stark contrast between western Oklahoma and the rest of the state was evident in the details. The Panhandle experienced its fourth driest spring on record while central Oklahoma had its 15th wettest.

The exaggerated moisture difference produced changes to the U.S. Drought Monitor. Extreme and exceptional drought increased in the western third of the state while drought was eliminated across much of central and eastern Oklahoma. May's final Drought Monitor map showed about 41 percent of the state being drought free, but 27 percent under the extreme-exceptional categories.

66.8°F

average statewide temperature
for May

4.9"

PRECIPITATION

statewide average for May

14.52"

RAINFALL

Recorded at Will Rogers Airport
for the month of May

0.08"

RAINFALL

Recorded at the Mesonet station
at Hooker in May

CALENDAR

JUNE

- ▶ 3rd: Logan County 4-H National Weather Center Tour, Norman
- ▶ 3rd: Challenges in Horticulture presentation, Stillwater
- ▶ 9th-14th: Oklahoma Mesonet Weather Camp for Middle School
- ▶ 14th: OK State Master Gardener Conference, El Reno
- ▶ 14th: Tour for NASA Mission to Planet Earth Teacher Workshop
- ▶ 27th-29th: OK Pecan Growers Assoc Annual Mtg, Ardmore

JULY

- ▶ 14th-19th: Oklahoma Mesonet Weather Camp for High School
- ▶ 25th: Mesonet Workshops, Oklahoma 4-H Roundup
- ▶ 25th-27th: Oklahoma Cattlemen's Association Convention

Thank you for 20 years of partnership!

- ▶ Cookson - Installed June 2, 1993

CONTACTS

Accessing recent (within the past 7 days)
Mesonet data

Contact: [Mesonet Operator](#)

Instrumentation, telecommunications, or
other technical specifications

Contact: [Chris Fiebrich](#)

Mesonet agricultural data and products

Contact: [Al Sutherland](#)

Mesonet meteorological data

Contact: [OCS Data Requests](#)

Earthstorm - K-12 educational outreach

Contact: [Andrea Melvin](#)

OK-First - Public safety outreach

Contact: [James Hocker](#)

OK-FIRE - Fire management outreach

Contact: [J.D. Carlson](#)

Not sure?

Contact: 405-325-2541 or [Chris Fiebrich](#).

FORECAST FOR JUNE

[Click here to view the original maps from the Climate Prediction Center.](#)

Chance for below normal precipitation

DISCUSSION: Increased chance for above normal temperatures across western Oklahoma. Increased chance for below normal precipitation across parts of far western Oklahoma and the panhandle.

Chance for
above normal
temperatures