The University of Georgia
Cooperative Extension Service
College of Agricultural and Environmental Science/Athens, Georgia 30602-4356

Poultry Housing Tips

Fogging Nozzles Vs. Soaker Hoses

Volume 9 Number 9 **July, 1997**

Recently there has been a substantial amount of interest in using soaker hoses to wet two-inch paper pad systems instead of fogging nozzles. Growers are interested in using soaker hoses for a number of reasons, the most important of which is doing away with two hundred or more clog-prone fogging nozzles. Secondly, a hundred feet or so of soaker hose is significantly cheaper than 200 nozzles, over 300 feet of schedule 80 PVC pipe, and a 3/4 hp booster pump. Finally, growers hope that a soaker hose system will produce less runoff than a conventional fogging pad system.

Recently a field test was conducted on a broiler farm in west Georgia comparing these two different methods of wetting a two-inch paper evaporative cooling pad. Two identical 40' X 500' dropped ceiling tunnel-ventilated broiler houses with seven 48" slant wall fans with discharge cones and two 36" fans with exterior shutters were used in the test. The houses had 60 feet of five-foot-tall pad on each side of the house installed approximately 10" from each side wall. The pads were typically wetted using three rows of 1 gal/hr plastic nozzles, 18" on center, approximately 18" from the pad surface. For additional cooling during extremely hot weather the houses were equipped with three rows of one gal/hr fogging nozzles (ten nozzles per row) running from side wall to side wall. The three rows of interior fogging nozzles were installed 30' on center in the middle of the house. Each house was equipped with a fogging pump capable of producing approximately 150 psi of water pressure.

The fans and fogging nozzles in both houses were controlled by a Choretime PNT electronic controller. The fogging nozzles were turned on in stages as house temperature increased. The top two rows of nozzles were turned on using line pressure (40 psi) at 82°F. If the house temperature continued to rise the controller would activate the pump to increase water flow to the pad (84°F). The bottom rows of nozzles were turned on manually if the top two rows of nozzles did not produce the desired level of pad wetting. Interior fogging nozzles were turned on if the house temperature climbed above 86°F. At no time were the fogging nozzles controlled by an interval timer.

The fogging pad system in one of the houses was modified to accept a commercially available system which wets the pad using a soaker hose instead of fogging nozzles. The soaker hose was installed under a cap which held the top of the pad in place. Water flow to the soaker hose was controlled through an electronic interval timer which based the timer setting according to outside temperature and relative humidity. The fogging nozzles which were previously used to spray the pad along with those inside the house were shut off. The electronic controller was set at 82°F.

Comparisons between the two systems were made during the first week of July when the birds were approximately eight weeks old and outside temperatures were in the nineties. When the outside temperature was in mid eighties the temperature entering the fogging pad was essentially the same as the pad wetted by the soaker hose. But, as outside temperature increased the pad wetted with the fogging nozzles began to produce more cooling. In the high eighties to low nineties there was a two

degree difference between the two systems. When the temperature reached the mid nineties the temperature difference increased approximately three degrees (i.e., fogging nozzles 81°F, soaker hose 84°F). On July 3 when outside temperature was in the high nineties the producer was concerned enough about the lower amount of cooling produced by the soaker hose that he switched it off and went back to using fogging nozzles to wet the pads.

The field observations confirm lab study findings that a fogging pad system produces between 15 and 20 percent more cooling than a soaker hose system (see *Poultry Housing Tips.* Fogging Pad Update. August 1996). In the morning when the air temperature is low and the humidity relatively high the cooling produced by an evaporative cooling system is fairly limited so 15 percent difference between two systems is barely noticeable. But, in the afternoon as temperatures increase and humidity decreases, the amount of cooling a two-inch pad system can produce increases to as much as 16°F and a 15 to 20 percent difference in cooling between two systems can make a significant difference in house temperature when you really need all the cooling you can get.

The reduction in cooling was the result of a variety of factors. First, since the pad was wetted from the top there was a tendency for the water to streak over the surface of the pad leaving relatively dry sections of pad where evaporative cooling was limited. The streaking was more pronounced toward the bottom when the outside air temperature was above 90°F. Second, the soaker hose did not appear to wet the interior surfaces of the pad as well as the fogging nozzles, possibly further reducing cooling. Finally, the fog created by the fogging nozzles likely cools the air slightly before entering the pad, thereby increasing the total amount of cooling produced by the fogging pad system.

Another factor to consider is that soaker hose systems typically do not have a booster pump. Without a booster pump it would be difficult to add interior fogging nozzles for use during extremely hot weather. For instance, during hot weather there is typically between a three- and five-degree temperature rise as the air travels from the pads to the fans. So if the air at the pad is 82°F it may be 85°F to 87°F at the fans. If the producer had 30 to 40 nozzles at half house he could maintain a temperature between 82°F and 83°F throughout the house. Using a soaker hose the air temperature at the pad may be 84°F and since there would not typically be any nozzles in the house it could be as warm as 88°F at the fans. So with a soaker hose system without a booster pump and interior nozzles a producer could be giving up three degrees cooling at the pad and six or more degrees at the exhaust fan end of the house on a 95°F day.

For the most part there was no significant difference in runoff between the two systems. The electronic controller appeared to limit the amount of runoff which has been a problem with other soaker hose systems. Both systems needed adjustments from time to time to minimize runoff.

It is important to note that both systems produced adequate cooling. If the producer had continued to use the soaker hose system on July 3 he would have probably been okay, but he like most of us did not want to take the chance. The fact of the matter is that soaker hose systems can work...but they do not produce as much cooling as a fogging pad system and the difference between the two systems is at its greatest when you need the cooling the most. Furthermore, the soaker hose system did not produce less runoff than a properly managed fogging pad system (see *Poultry Housing Tips, Managing Fogging Pad Runoff*, May 1996).

There are other questions about using a soaker hose instead of fogging nozzles that still remain unanswered. For instance, will soaker hose pad systems have an increased tendency to clog with dust considering there is no water spraying on the surface of the pad? Will the tendency for streaking become worse over time? And will the pads last as long. As with many other questions only time will tell.

Michael Czarick
Extension Engineer
(706) 542-9041
(706) 542-1886 (FAX)
mczarick@engr.uga.edu