

Poultry Housing Tips

Problems with Evaporative Cooling Pad Distribution Systems

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There seems to be four major complaints when it comes to traditional evaporative cooling pad systems: I can't get my entire pad wet, the holes water distribution pipe clogs frequently, my pads are clogged with dust and algae, and water leaks from the distribution system cover making a mess of my house near the pads. Until recently many people thought these problems are just part of having a evaporative cooling pad system. But, some of the recent changes in water distribution system design have reduced these problems significantly.

A study conducted last summer of two different types of distribution system illustrated how water distribution system design can aggravate to the aforementioned problems. The two distribution systems were similar except for two major differences. The holes in the distribution system of System B were larger (Figure 2 - a), $5/32$ " vs. $3/32$ ", slightly further apart (2 " vs $2\ 1/2$ "), and had two splash guards (Figure 2 - b,c) . The water distribution systems were on the same commercial layer house, water pumps were the same size, and the same type of pad was used in both systems (6 " low efficiency pad).

Despite the fact that the water went through a filter before entering the distribution system, approximately half of the holes in the distribution pipe of System A were clogged after three weeks of operation. With half of the holes clogged, only 70 percent of the evaporative cooling pad was wet, resulting in reduced cooling. A second problem caused by the clogged holes was that the water pressure was increased to such a level that the water coming out of the remaining holes spray so hard against the cover that the water escaped from the lip of the cover that held the pad (Figure 3 - a), leading to puddles on the floor next to the pad.

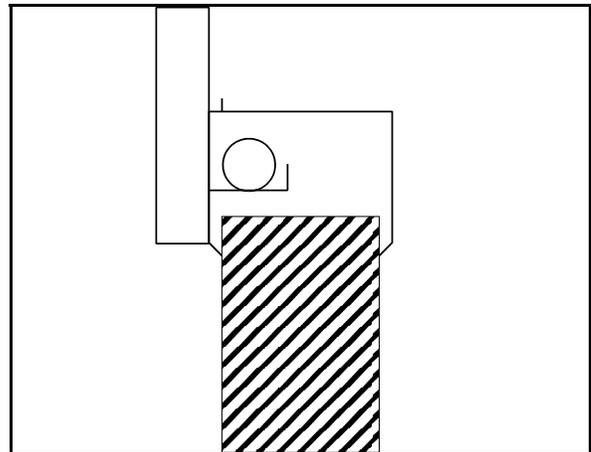


Figure 1. Water Distribution System "A"

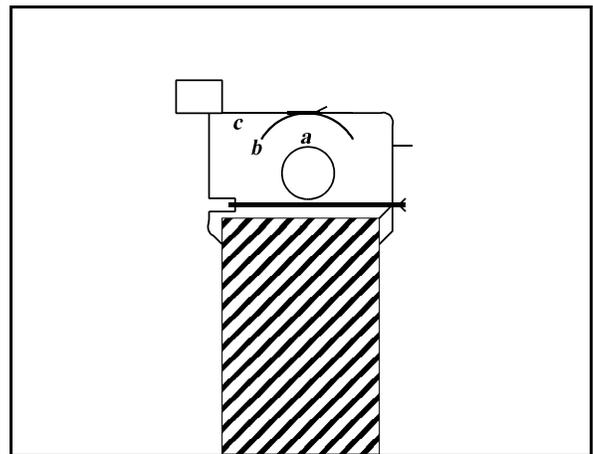


Figure 2. Water Distribution System "B"

Normally when there is spray coming from the cover the producer will partially close the valve to the distribution system to limit the amount of water going to the distribution system. Though this does solve the puddle problem it typically leads to bigger problems. By restricting water to the distribution system the amount of water flowing over the surface of the pad would be reduced leading a drier pad and reduced cooling. Furthermore, since water flow over the pad tends to clean the surface of the pad, a reduction in water flow would have lead to surface of the pad clogging with dust. If the damp dust remains on the pad for too long the exposure to sunlight will encourage the growth of algae.

After the fourth week of operation the holes in the distribution system were unclogged using a piece of wire. Approximately four weeks later, 40% of the holes were again clogged.

In contrast after four weeks of operation only two of the approximately 660 distribution system holes were clogged on System B, indicating the importance of larger holes. By the end of the summer the number of clogged holes in water distribution system was less than a dozen. No dry sections of pad were noticed during the entire summer. The additional spray deflector (Figure 2 - b) helped to focus the water in the middle of the pad (Figure 4), minimizing the amount of leakage from the distribution system cover. The only excess water problems were primarily related to poor connections between sections of the water collection gutter at the bottom of the pad.

Since this study the manufacturers of System A have modified their water distribution system (Figure 5). Hole size and spacing has been increased and a second spray deflector has been added. Preliminary observations have shown a significant reduction in the aforementioned problems.

If you have a distribution system that resembles System A, it can be modified fairly inexpensively. All that is required is the replacement of the existing distribution pipe with one with larger holes, and the fastening of a second spray deflector, made of galvanized metal, to the original splash guard. Contact the manufacturer of your distribution system for additional information.

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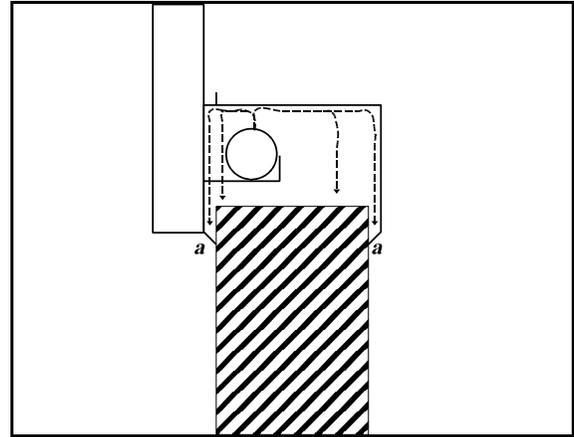


Figure 3. Water Spray Over in System A

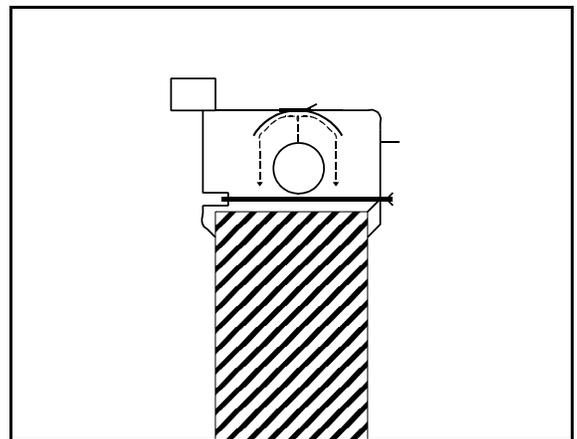


Figure 4. Spray Deflector (System B)

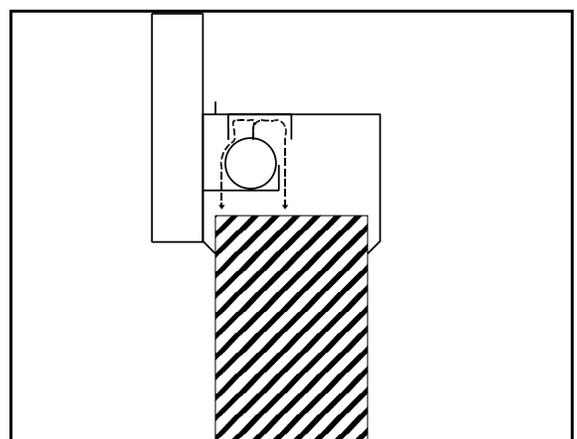


Figure 5. Modified Distribution System A