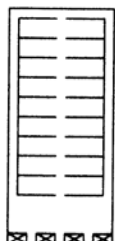




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Designing Fogging Systems for Tunnel-Ventilated Houses



Michael Czarick
Extension Engineer

Michael Lacy
Extension Poultry Scientist

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Many producers who have modified their existing houses for tunnel ventilation have discovered that the high air speed and uniform air movement generated in these houses greatly increases the number of fogging nozzles which can successfully be used. In fact, some producers have installed up to twenty 1 gal./hr. nozzles per 48" fan, nearly three times the number that existed in their houses prior to the retrofit, without causing house wetting problems. With the additional fogging nozzles producers have found that they can decrease house temperature twice as much as before, thereby minimizing heat stress related problems.

Though it is possible to significantly increase the number of fogging nozzles in a tunnel-ventilated house, care has to be taken with nozzle installation to minimize maintenance and moisture problems. If precautions are not taken, the full cooling potential will not be realized, and production will suffer.

Listed below are some general guidelines to follow when designing a fogging system for a tunnel-ventilated house:

Number of nozzles:

To reduce air temperature by 10°F, a tunnel-ventilated house requires between 15 and 20, 1 gal./hr. nozzles per 48".

Nozzle size:

Provided there is no problem with water quality, 1 gal./hr. nozzles typically provide the best performance. The 1 gal./hr. nozzles produce a finer mist which evaporates more quickly, minimizing house wetting. If water quality is a problem, a reduced number of 2 gal./hr. nozzles can be used.

Some producers have had success using a combination of 1 and 2 gal./hr. nozzles. The 2 gal./hr. nozzles are placed toward the center of the house and the 1 gal./hr. near the side walls. The larger water droplets produced by the 2 gal./hr. nozzles are more easily supported by the greater air movement in the center of the house and moisture problems are minimized.

PUTTING KNOWLEDGE TO WORK

Nozzle type:

Stainless steel nozzles appear to hold up better and have less clogging problems than brass ones. The disadvantage of stainless steel nozzles is that they are more expensive, typically twice as much.

System pressure:

The fogging system pump should be capable of providing between 180 and 220 psi of water pressure. The higher water pressure increases the amount of water put out by the nozzles by as much as 50%, and produces a finer mist. With 2 gal./hr. nozzles, care has to be taken at the higher pressures since they will actually be putting out more than 3 gal./hr.

Nozzle placement:

Fogging lines should run across the house from side wall to side wall. This arrangement provides optimum fog distribution and maximum flexibility in the operation of the system. If the lines are run from the side walls to the peak of the ceiling, nozzle clogging problems are typically minimized.

More nozzles should be concentrated in the first 100' of the house. This area is typically the hottest because so little water has been added at this point. Place nozzles across the tunnel opening as well as across the house in the vicinity of the tunnel opening. A little bird wetting at times is desirable since it is very difficult to lower the air temperature enough in this region to make the birds comfortable. Fogging lines installed past the tunnel opening should be placed on 40' centers, stopping 60' to 80' from the exhaust fans.

Type of pipe:

One-half inch, schedule 40 pipe, is sufficient for a 200 psi system. Care should be taken when putting the system together. When gluing joints, clean the pipe, place glue on both pieces, insert and give a 1/4 turn (no more).

Fogging system control:

With large numbers of fogging nozzles, it is advantageous to have an "A" and "B" system. If all of the fogging nozzles were to come on first thing in the morning or in the evening, serious house wetting problems can result. Installing two separate systems, with two different thermostat settings, minimizes house wetting problems and makes the system easier to manage during humid weather or when young birds need cooling.

24-hour time clocks:

Controlling the fogging pump with a 24-hour time clock, in addition to the thermostats, will insure that the nozzles don't come on too early in the morning or stay on too late at night.

Dump valves:

It is advantageous to design the fogging system so that it is automatically drained when the pump shuts off. Pressure activated valves (maximum two per system) can be installed at low points in the lines, i.e. near the pump or tunnel curtain openings. Many producers have found that by draining the lines when the pump shuts off, the incidence of nozzle clogging is reduced.

Cut-off valves:

All the fogging lines running across the house should have cut-off valves. The valves allow the producer to fine tune the number of nozzles operating as well as where the water is being added. In addition, cut-off valves allow the inspection, cleaning or replacement of individual nozzles without shutting off the entire system.

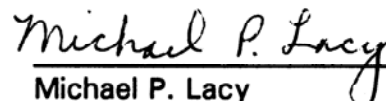
Faucets:

A couple of hose faucets in the fogging system allow the pump to be used for cleaning purposes between growouts.

On the following page is an example of a fogging system design which incorporates the guidelines listed above.

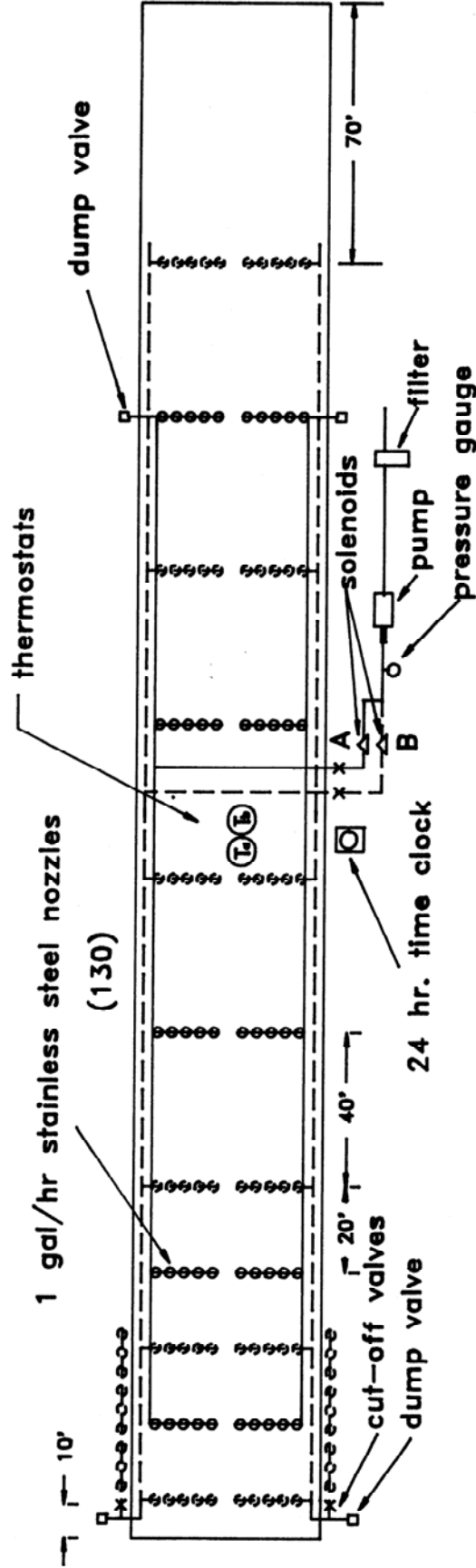


Michael Czarick
Extension Engineer
(706) 542-3086



Michael P. Lacy
Extension Poultry Scientist

Broiler House Fogging System (400')



- 1) 1/2", schedule 40, PVC pipe.
- 2) Cut-off valves on all spur lines.
- 3) Inlet nozzles in middle of curtain opening, angled up at 30 degrees
- 4) 200 psi booster pump
- 5) 7 or 8, 48" exhaust fans
- 6) 500' house would require 6 more spur lines
- 7) Fogging system A thermostat setting = 84 F
- 8) Fogging system B thermostat setting = 88 F

Michael Czarick
University of Georgia
Extension Engineering
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