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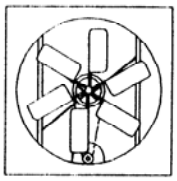

Comparing Poultry House Exhaust Fans

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Trying to decide what equipment to install in a poultry house can be frustrating. Everybody claims to make the best feeder, drinker, or heater and they all have data to support their claims. One area where this has been a particular problem is poultry house exhaust fans. All fan manufacturers seem to claim their fans move more air with less electricity than any of their competitors' fans. Who is a grower to trust?

To help growers with this dilemma, the University of Illinois, with the support of the Wisconsin Farm Electrification Council, has started an agricultural fan testing program. Fan testing is not new to the poultry industry. Most exhaust fans on the market today have been tested by the Air Movement and Control Association (AMCA) to determine air moving capacities at different pressures. But the University of Illinois testing program has some important differences. First, all tests are conducted with shutters and guards (screens) in place. As you might expect, when you put a shutter or guard on a fan, this tends to reduce fan capacity. In fact, tests conducted at The University of Illinois have documented that even new shutters reduce air flow between 10% and 25% and that guards reduce air flow by as much as 5%. This means that the output listed by many fan manufacturers run 10 to 30 percent more than the fan would move in the field.

A second difference of the University of Illinois fan testing program is that it examines the energy efficiency of each fan. A energy efficiency rating of how much electricity is required to move each cubic foot of air (cfm/Watt) is determined at different levels of static pressures for each fan. With this information it is possible to calculate how much it would cost to operate one fan over another. In addition, a producer with a conventional curtain-sided house might compare the energy efficiency of two different fans at a static pressure of 0.05; whereas a grower with evaporative cooling pads, which require more work (higher static pressure), might compare fans at a 0.10" static pressure.

By comparing fan energy efficiency ratings, a significant amount of money can be saved. For instance, if one fan has a rating of 25 cfm/Watt and another has a rating of 20 cfm/Watt and both fans move the same amount of air, a grower could reduce his fan electricity usage by 20 percent by buying the more energy efficient fan.

The University of Illinois publishes a booklet of fan test results. Everything from 12" to 48" fans are included. The booklet contains a lot of useful information. On the next page is an example of the information provided.

1

Manufacturer:

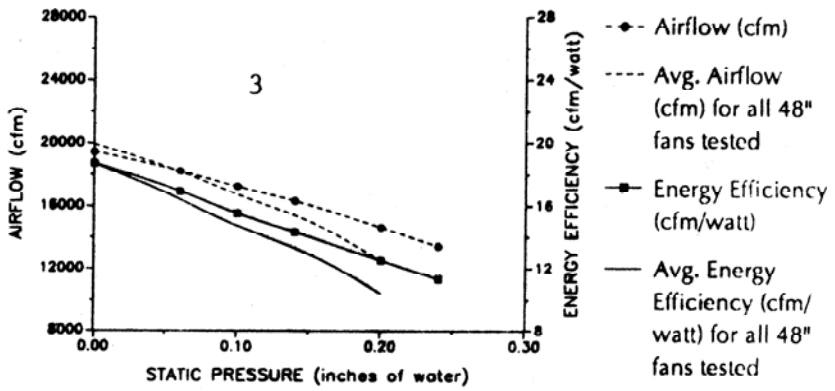
2

Fan Description:

48" belt driven fan; 1 hp 115/230V motor model 4K124; wood housing; aluminum shutter; guard.

a Static Pressure (in. wg)	b Fan Speed (rpm)	c Measured Air (cfm)	d Energy Eff. (cfm/Watt)
0.00	498	19,400	18.7
0.04	497	18,600	17.4
0.10	497	17,200	15.5
0.15	496	16,100	14.3
0.20	495	14,600	12.5
0.25	—	—	—

4



1) **Fan model No.:**

2) Fan description: Type of housing, motor, shutter and if the fan has a guard.

3) Air flow graph: The graph illustrates how much air the fan moves and the energy usage per cfm at different static pressures compared to the average of all the fans tested. The solid lines represent the energy efficiency of the fan (right hand side of the graph) and the dashed lines represent the amount of air moved by the fans (left hand side of the graph). In the graph above, the fan tested was above average in both amount of air moved as well as energy efficiency.

4) Air flow and energy efficiency chart:

a) Static Pressure: Each fan is tested at different static pressures. Most negative pressure houses operate in the range of 0.04" to 0.10". Comparisons between exhaust fans ideally should be made at 0.10". If the fan is to be used in a dark-out pullet house, a static pressure of 0.15" should be used.

b) Fan Speed: Allows producers with this specific fan to determine whether their fan is operating at the proper speed. If the speed is too low, the belts could be loose, or the motor may have the wrong pulley size.

c) Measured Air: Amount of air this fan moved at the various static pressures.

d) Measured Eff.: The amount of electricity required to move 1 cubic foot of air per minute at the different static pressures.

One thing the tests do not address is the quality of the fans. One fan may move slightly more air and be a little more energy efficient; however, if you only get 5 years use out of it, does it really save you anything? One of the best ways to know how long a fan will last is to ask people who have the type of fan you are considering.

You can order a copy of the test booklet by sending a check payable to The University of Illinois for $5 to:

Steve Ford
1304 West Pennsylvania
Ag. Eng. Sciences Bldg.
Urbana, IL 61801
(217) 333-7964

Also, most of the major fan manufacturers or their distributors can provide you test information for their fans.

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