

North Carolina Poultry Industry Joint Area Newsletter

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PROPERLY MAINTAINED FAN BELTS AND PULLEYS WILL SAVE YOU MONEY

Sanjay Shah, Biological and Agricultural Engineering Department, NC State University

In belt driven fans (virtually all 48 in. fans or larger), the power is transferred from the electric motor to the fan blades using a v-belt (endless or link). To ensure that maximum power is transferred from the motor to the fan, the belt system should be maintained properly. The late Dr. Bob Bottcher showed that a worn v-belt (glazed or hardened surface), even when properly tensioned, ran 30% slower than a new belt because it rode lower in the driver and driven pulleys. A poorly tensioned v-belt will cause the fan to run even slower. These factors can greatly reduce your fan airflow rate and increase power consumption. Let's say, you have a 48 in. fan with a 1.5-hp motor that runs 3,000 hours per year when properly tensioned. If the v-belt is not tensioned properly, the fan may have to run 30% more or 3,900 hours per year. At 5.5 ¢/unit of electricity, you could spend \$50 more in electricity per fan. Hence, the fan system should be treated as a profit center and maintained properly. There is no better time than to do it now, as summer is just around the corner. **But remember to unplug your fan before you take off the shutter.**

The two most common sources of reduced fan performance are improper tension and misalignment of the pulleys. The most common reason for improper belt tension is the absence of an automatic tensioner. The best automatic tensioner is a spring-loaded motor mount; the motor's weight keeps the belt tight and as the belt stretches, the spring helps maintain proper tension. Another automatic tensioner has an idler pulley on a spring loaded arm. A more laborious

option is an adjustable tensioner that requires periodic adjustment. McMaster Carr is one of many suppliers that sell tensioners (www.mcmaster.com; search under 'drive tensioner') as well as idler pulleys. On many fans, you need to slide the motor to obtain the required belt tension; such fans should be equipped with tensioners.

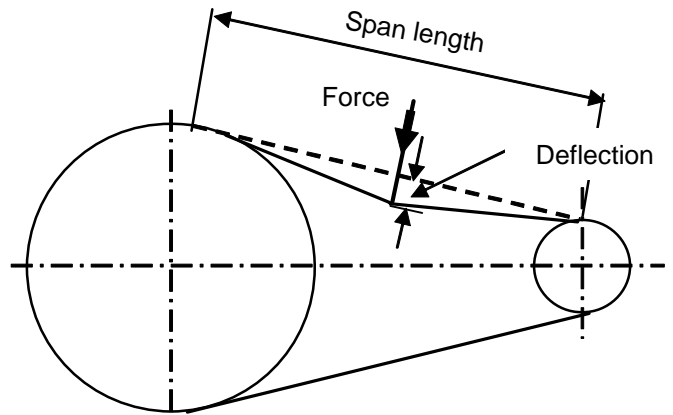


Figure 1. Span length and deflection measurement in a v-belt system

However, when a belt wears out, it has to be replaced and the new belt has to be tensioned. For this, the belt span, or the distance between the points where the belt touches both pulleys has to be measured (Fig. 1). The deflection (at midpoint along the span length) and the force (specified by the manufacturer) required to obtain that deflection are measured (Fig. 1) using a belt tension gauge. McMaster Carr also sells belt *(continued page 2)*

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PROPERLY MAINTAINED FAN BELTS AND PULLEYS WILL SAVE YOU MONEY

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tension gauges that come with user instructions. For each inch of span length, a deflection of 1/64 in. is required; so, for a 24-in. span length, a total deflection of 3/8 in. is required. The force required depends on the diameter of the smaller pulley and type of belt. For example, for an A type v-belt with a 3 in. pulley, about 3.3 lb of force is applied for initial installation. Since the belt stretches substantially during the first 24 hours of operation, if the fan is not equipped with an automatic tensioner, the belt should be re-tensioned again, but using a lower force (about 70 to 90% of the initial force). Regular re-tensioning is required when an automatic tensioner is not provided; even, with an automatic tensioner, the belt should be inspected and its tension checked after each flock (if the fan was used). A link belt can be shortened to the right tension by taking out a link; however, both endless and link belts that appear worn out, frayed, or glazed, should be replaced. Remember that belts that are too tight can ruin your motor bearings.

If you are considering installing a tensioner with an idler pulley, the best location is on the slack side. For example, in Figure 1, if the driver pulley (small one) is rotating clockwise, the idler should be installed on the slack side, i.e., on the lower portion. Installation of the idler can be done either inside or outside the belt; each has its own advantages and disadvantages. If you have the flexibility, the best location to install the idler is where you have more-or-less equal angle of wrap around both pulleys.

When the two pulley shafts (fan and motor) are not parallel to one another, the system is said to be misaligned. Misalignment of the pulleys can result in damage to the belt and pulleys and will also reduce fan airflow rate. One good way to check for misalignment is to put a straight edge (even, a straight piece of steel strip) against the face of the large pulley. In a correctly aligned system, the straight edge touches against all four edges of the two pulleys (Fig. 2(a)). In an incorrectly aligned system (Fig. 2(b)), it will not touch all four edges as shown by the sign × beneath the arrow. While perfect alignment is desirable, a misalignment of up to 1/10 in. per ft of distance between the shafts is acceptable. This misalignment is the gap width between the straight edge and the pulley face at the center of the pulley (see Fig. 2(b)).

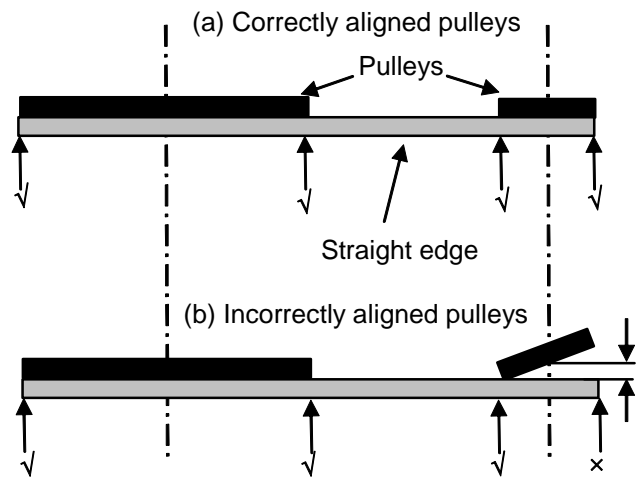


Figure 2. Alignment check for pulleys

There are other things to be considered when thinking of fan system maintenance. If you have any questions, do not hesitate to contact me - I am there to help.

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Poultry Youth Programs

Melissa Scherpereel

Poultry Youth Programs Website

www.poultry4h.info

Be sure and check out the NEW website for Poultry Youth Programs at North Carolina State University. There is an updated calendar of events to help you with your yearly planning and tons of great information and resources.

Topics on the site include: embryology, the youth market turkey show, poultry judging, 4-H Congress, the new poultry poster contest, summer institute and much more.

Annual Youth Market Turkey Show Recap

The Youth Market Turkey Show kicked off the NC State Fair on October 13, 2006. The 165 participants in the show were evaluated on the overall weight of their turkeys, the muscling in the breast and legs, and how well each participant had taken care of their bird. The preparation for this event began in early June, when individuals picked up three to four, day old turkey poults from NC State Universities poultry facility. The youth were then responsible for feeding and caring for

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Poultry Youth Programs

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their birds until the NC State Fair, where all of their hard work would be put to the test. From just a couple of ounces of peeping fuzz that fit in your palm, to an average of thirty pounds that now required both hands to hold, youth learned how to raise turkeys and literally “grew” with their projects.

The 2006 grand champion turkey was shown by Evan Gunter, 10, of Asheboro (Randolph County), and was sold to Harris Teeter for \$5,500. Kyle Lucky-Smith, 16, of Clyde (Haywood County), exhibited the reserve champion turkey which N.C. Farm Bureau purchased for \$3,000.

A special thank you to all those in the Department of Poultry Science at NC State University that helped make this event possible. Last but certainly not least, Thank you to Prestage Farms for their generous donation of turkey poults that allowed this event to happen. Mark your calendars for this years show, Friday October 12, 2007 at the NC State Fair.

For more details please visit our website at www.poultry4h.info and click on turkey show or directly at www.ces.ncsu.edu/depts/poulsci/4h/turkeyshow/turkeyshow.html Here you will see wonderful pictures from last year’s event.

Poultry Science Summer Institute to be held at NC State University

The summer institute is a three-day, four-night conference designed to broaden the high school student’s understanding of the educational disciplines, scholarship opportunities, careers and industries related to poultry science. Participants were selected by an application process. Students participating in the program will get to interact informally with numerous NC State Univ. faculty, staff and current poultry science students. Attendees will learn about the vast field that is Poultry Science as well as specific information on our Poultry Science Degree Program and areas such as:

- Career Fields & Areas of Opportunity
- Scholarship Requirements and Availability
- Internships while Attending College
- Employment Connections upon Graduation
- How to Apply to College and When
- and about anything else you would like to know!

For more information please e-mail: melissa_scherpereel@ncsu.edu or call (919) 515-5403. You can also visit our website at www.ces.ncsu.edu/depts/poulsci/4h/institute.html The Institute will be held July 29 – August 2nd.

2007 Poultry Poster Competition

The 1st annual Poultry Poster Contest is designed to be an educational activity for youth to learn about our poultry industry across North Carolina. The theme for the 2007 contest is "Poultry in North Carolina". Youth should incorporate this theme into their posters. Competition in this contest will be conducted on an individual basis in four divisions; Division I (9-12 years of age), Division II (13-15 years of age), and Division III (16-19 years of age) at the county and state level. Youth in Division IV (5-8 years of age) will participate on a non-competitive basis at the county level only.

Posters should be a standard 22" X 28" size. The following awards will be provided to state winners in Division I, Division II, and Division III by the U.S. Poultry and Egg Association and the NC Poultry Federation: First Place: \$50 cash, Second Place: \$35 cash, Third Place: \$25 cash.

For complete rules and information visit www.ces.ncsu.edu/depts/poulsci/4h/poster.html

New Departmental Extension Leader Named



Mike Wineland was recently appointed as Departmental Extension Leader.

Mike has been in the NCSU Poultry

Department and Cooperative Extension since December 1983. His responsibilities have been primarily to the Broiler Breeder and Hatchery segments of the NC industry. Mike will continue with these duties as well as oversee and help facilitate delivery of the overall poultry Extension programing in the state.

Renewable Energy and Energy Efficiency Improvement Program

James Parsons, Area Specialized Agent, Poultry

USDA Rural Development has developed a grant and guaranteed loan program called the "Renewable Energy and Energy Efficiency Improvement Program" that can be used by an agricultural producer or a rural small business.

An agricultural producer is defined as an individual or entity directly engaged in the production of agricultural products and obtains at least 50% or greater gross income from their agricultural business. A rural small business can be considered for the program if the business is in accordance with the Small Business Administration size standards.

This is one of the better programs that have been offered to farmers in recent years. However, the grants and/or loans must be used to upgrade or retrofit exist conditions or practices to improve energy efficiency. New construction is ineligible for consideration.

These grants can cover up to 25% of eligible project costs. The minimum energy efficiency grant is \$1,500.00 and the maximum is \$250,000.00. The minimum renewable energy grant is \$2,500.00 and the maximum is \$500,000.00. Simply stated, the project you select must cost at least \$6,000.00 to qualify for an energy efficiency grant and \$10,000.00 for a renewable energy grant.

Poultry farmers can take advantage of this program in several energy related areas. My Poultry Specialized Advisory Committee recently met with representatives from USDA Rural Development and identified several projects that will qualify for energy efficiency grants on poultry farms. These include but are not limited to: replacing traditional pancake brooders with infra-red tube heating or infra-red brooders, replacing lighting systems, installing dropped ceilings, replacing standard curtains with insulated curtains, replacing insulation on sidewalls and doors, using paddle fans in some situations to improve ventilation and reduce fuel cost, replacing existing fans with high efficiency fans, using fan covers when fans are not in use and possibly switching to solar powered water pumps. As you can see, many of your routine maintenance costs will qualify for a grant.

The cutoff deadline line for 2007 applications is May 18, 2007.

However, you may complete and submit an application any time during the year. If you need more assistance or have questions, you should call the USDA Rural Development office in the county in which you reside.

Contacts for the North Carolina Poultry Industry Newsletter

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