

# Save energy with right lighting

**A**S summer makes way for fall and days grow shorter, indoor and outdoor lighting around the farmstead is increasingly important. Dwindling daylight hours provide less natural lighting throughout the busy harvest season, increasing the need for proper farm lighting.

Lamps and fixtures on the farmstead are often exposed to humidity and other



## Farm Energy

By DANA PETERSEN

extreme conditions. This may reduce the effectiveness of lighting, according to Jay

Harmon, Iowa State University professor in ag and biosystems engineering.

"Lighting in and around farm buildings often face severe service issues more commonly found in outdoor lighting applications," says Harmon.

Harvest creates a lot of dust that may obscure the surfaces of skylights, windows and light fixtures found in farm buildings,

thereby reducing lighting levels.

For a safe, well-lit working environment, try to keep those surfaces clear of dust and debris, says Harmon. "Dust, humidity and fluctuating temperatures can shorten bulb life and reduce output from light fixtures over time," he notes. "When possible, clean the surfaces of light fixtures, windows and skylights in farm buildings to maximize natural and electrical lighting."

Proper farm lighting creates a safer working environment, says Harmon. He says bulbs and fixtures in farm buildings often don't last as long as expected. The "average rated life" that appears on their packaging is determined in a laboratory setting.

Despite their shortcomings, compact fluorescent lamps, or CFLs, and light-emitting diodes, or LEDs, provide savings because they require significantly less electricity than the older incandescent bulbs. Although the official U.S. legislation phasing out the sale of 100W incandescent bulbs was postponed, the law will be enforced beginning in October.

Incandescent bulbs are inexpensive to buy, but most of the electricity powering them is wasted as heat, making them a costly lighting source. LEDs are advancing and becoming more affordable, and will soon be more competitive with CFLs.

### Lighting vocabulary

Here are definitions of common terms:

■ **Lumen.** Light that can be perceived by the human eye is measured in lumens, or lm. Some parts of the light spectrum aren't visible to the naked eye and therefore aren't included in the lumen measurement. In this way, lumens allow us to quantify the power of the light we see.

■ **Foot-candles.** The level of lighting at a working surface is measured in foot-candles. One foot-candle, or fc, is defined as the amount of illumination from a candle falling on a surface at a distance of 1 foot. Light meters typically measure light levels using foot-candles. One foot-candle is equal to 1 lumen per square foot, so a brightly lit desk may register approximately 100 fc, while a sunny day outdoors could be as much as 8,000 fc.

■ **Watt.** The amount of energy consumed or produced by something can be measured in watts. Most incandescent bulbs are rated using watts. The equivalent of 1 watt is 1/746th horsepower.

■ **Efficiency.** Lighting efficiency is measured in light produced per unit of electricity consumed. Units are lumens per watt, or lm/W. For example, 1,200 lumens from a 20-watt bulb equals 60 lm/W.

■ **Average rated life.** This means the average number of hours for half the bulbs in a test batch to fail. Average rated life is measured under ideal laboratory conditions. Actual bulb life may be shorter, especially if the bulb is not rated for an enclosed fixture but enclosed in a globe. Repeated exposure to dust, extreme temperatures or humidity, power surges, or constant on/off cycles may shorten life.

For more on farm lighting, see "Indoor Lighting for Livestock, Poultry and Farm Shop Facilities," PM 2089R, at [farmenergy.exnet.iastate.edu](http://farmenergy.exnet.iastate.edu) or follow @ISU\_Farm\_Energy on Twitter.

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