United States Department of Agriculture
NRCS Natural Resources Conservation Service

Farmstead Energy Improvement

(Bulb Replacement in Poultry Houses)

Georgia Job Sheet No. GA374A

Definition

Poultry houses often use incandescent lights. These bulbs can be replaced with energy saving CCFL (Cold Cathode Florescent Lamp), CFL (Compact Florescent Lamp) or LED (Light Emitting Diode) bulbs to significantly reduce the energy usage associated with lighting.

General Information

The main goal of poultry house lighting is to provide intense, uniform light in the brood chamber, especially over the feed and water lines. After chicks are turned out into the whole house, the lighting should also satisfy the dimming requirements for the remainder of the growout. A cookie-cutter approach to lighting system design is impossible; however, local complexes can usually develop 4 – 5 lighting arrangements to satisfy most of their growers.

CCFL bulbs work very well with the modern type dimmers. CCFL bulbs are typically 8W (45-55W incandescent equivalent) with a typical life of 22,000 – 25,000 hours. However, lumen depreciation (LD) with CCFLs is significant. Additionally, when CCFL bulbs are dimmed to very low levels, as during catch, bulb stress increases LD and may result in a significant reduction in useful bulb life.

There are two very different types of CFL bulbs, dimmable and non-dimmable. These bulbs should have a life span of 8,000 – 12,000 hours. Dimmable CFL bulbs are available in 15W (70W incandescent equivalent) and a 23W (100W incandescent equivalent). Non-dimmable CFL bulbs can range in wattage from 15W to 65W and are typically used as supplemental lighting to satisfy integrator lighting requirements during brood. Non-dimmable CFL bulbs in the 15W to 26W range are the least expensive and most cost effective bulbs if they can be used in the lighting system.

Dimmable CFL bulbs can be used as grow out bulbs, just like CCFL bulbs. They also have a significant LD rate and can suffer similar bulb damage at low level dimmer settings.

Changes in LED bulb technology are making these bulbs better adapted to the poultry house. The cone-shaped light pattern of some LED bulbs can sometimes makes lighting uniformity in the poultry house a challenge.

Farmers cannot receive federal funds from two sources to pay for bulb replacement.

Installation

Lighting systems must be designed by a professional, and comply with the integrator's requirements. Any new electrical wiring must be certified by the contractor performing the installation.

Older keyless sockets are highly susceptible to corrosion that could lead to premature bulb failures and dimming problems. In almost all cases, these older sockets should be replaced with nickel-plated brass screw shell keyless sockets fixtures for new bulbs.

Some older open ceiling poultry houses may require additional bulb receptacles or circuitry in order to provide any level of reasonable lighting, or they may require a higher wattage (greater lumen output) LED bulb to provide the required level of light.

Operation and Maintenance

High wattage dimmers designed to work with incandescent light bulbs typically do not operate in the same manner with CCFL and dimmable CFL bulbs. Exact target dimming levels depend on the integrator and should be determined by using a good light meter at the bird level. Proper steps must be used to calibrate dimmers (See Poultry House Light Dimming Issues, Newsletter no. 68 of the National Poultry Technology Center, Auburn University).

CCFL and CFL bulbs contain mercury, which is a toxic element. Local and state laws should be followed for proper disposal of these bulbs. In the event of bulb breakage, the affected area should be thoroughly cleaned. Spent and broken bulbs should be double bagged and taken to a recycling center.

The finned heat sinks on some LED bulbs collect dirt and debris and need regular cleaning to ensure the bulbs don't prematurely fail.

Spiral bulbs without globes collect dust and should be cleaned between every flock. All bulbs need periodic external cleaning.

References

NRCS GA Conservation Practice Standard, Farmstead Energy Improvement, Code 374.

Energy Efficient Lighting, Newsletter no. 59, National Poultry Technology Center, Auburn University, May 2009.

Broiler House Lighting Development, Newsletter no. 64, National Poultry Technology Center, Auburn University, February 2010.

Poultry house Light Dimming Issues, Newsletter no. 68, National Poultry Technology Center, Auburn University, October 2010.

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Bulb Replacement

Poultry Farmer:_____ County:_____ Date: _____

Integrator:_____ Number of houses:_____

Farm No.: _____ Tract No.:_____ Assisted By:_____

House One

Number of incandescent bulbs to be replaced:_____

Total CCFL Bulbs to be used:_____

Total dimmable CFL Bulbs to be used:_____

Total non-dimmable CFL (brood) Bulbs to be used:_____

Total LED Bulbs to be used:_____

Are all houses the same ( ) yes ( ) no. If no, make same calculations for each house.

Total bulbs (all houses):

CCFL Bulbs:_____

Dimmable CFL Bulbs:_____

Non-Dimmable CFL Bulbs: _____

LED Bulbs: _____

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Farmer Certification:

I certify that I am not receiving other federal funds for bulb replacement (TVA rebate program for LED bulbs or the USDA RD Rural Energy for America Program) for these poultry houses.

_____ _____

Name Date

Installation Certification:

I certify that the installation for the new lighting system in the poultry houses on this farm was completed according to local electrical requirements.

_____ _____

Name Date