



InSpire® transpired solar duct at turkey brooder farm, Snow Hill, N.C.

Situation

Young pigs, turkeys and broiler chicks require a substantial amount of supplemental heat because they cannot produce enough body heat themselves. Producers usually use propane to power supplemental heaters for use in livestock barns.

While propane prices have shown a slight upward trend, the larger issue is price volatility. This instability leads to market uncertainty and makes it difficult for managers to plan in advance.

Task

The Department of Biological and Agricultural Engineering personnel at North Carolina State University wanted to explore a potential alternative source of energy. Their goals were to reduce farmers' dependency on propane, lower energy consumption and improve farmers' ability to accurately predict heating costs.

Action

Transpired solar collector (TSC) ducts were installed at a swine nursery and a turkey brooder farm in eastern North Carolina. Each farm had a test (TSC duct equipped) and an identical, adjacent control treatment.

Five swine herds and six turkey brooder flocks were monitored over two heating seasons (2010-12).



InSpire wall solar duct at a swine nursery, Roseboro, N.C.

Results

The TSC systems produced measured propane reductions of 22.6% and 8.3%, respectively, in the swine and turkey barns. Simple payback periods for the TSC ducts at both farms were favorable with tax incentives and USDA Rural Energy for America Program funding, with the payback periods for the swine nursery and turkey brooder farm being 4.2 and 3.6 years, respectively.

Additionally, animal performance in the test treatment were better for reasons that are not understood.

This study concluded that the InSpire as shown potential for providing supplemental heat to animal barns in eastern North Carolina.

Research was conducted by North Carolina State University. For further information contact Dr. Sanjay Shah, Extension Specialist and Associate Professor.

Support was provided in-part by ATAS International with use of subsidized transpired solar collectors. www.atas.com

Funding provided by: USDA Natural Resources Conservation Service.