



Stam Greenhouse Oskaloosa, IA

Technical Specifications

4 - 165,000 Btu A-Maize-Ing

LDJ620-10 Corn Furnaces

Pax ex auger

Project Cost: \$19,682

AERLP: \$9,100

Loan Term: 4 yrs.

Lender: Leighton State Bank,
Leighton, IA

Lender Share: \$9,100

Annual Ave. O & M Cost: \$5,824

Installation Date: November 2003

In November 2003, Brent Stam installed four corn-burning, forced-air furnaces – each rated at 165,000 BTUs – to heat the 6,000 square-foot Stam Greenhouse in Oskaloosa. Stam estimated that the greenhouse’s heating load might go as high as 800,000 BTU at times, and he designed the system to meet 80 to 90 percent of the facility’s needs, with existing natural gas furnaces making up the difference.

Project History

Stam says that the winter of 2001-2002 was an alternative to natural gas in order to “stay competitive or even stay in business.” He notes that as the winter became colder and his heating bills increased as gas prices increased concurrently.

As he considered his options, his main priority was to find a fuel that was easy to handle, equipment that was easy to clean, and had a reliable source of affordable spare parts. Stam spent a year and a half researching products and visiting several manufacturing plants, focusing on furnaces using three types of fuel: coal, wood, and corn. He eventually decided that corn furnaces were the only choice that met his criteria, but he found no examples of greenhouses using them as a primary heat source.

He chose A-Maize-Ing Heat units, made by LDJ Manufacturing in Pella, for several years. The units Stam built models featuring interchangeable parts, they had been on the market for several years, and their products were UL listed. Stam installed the units himself with the help of an electrician and says the process went smoothly.

System Performance

Stam hasn’t recorded fuel usage before or after the furnaces were installed. But he estimates that his natural gas consumption ranged from about 10,000 to more than 15,000 therms per season prior to the corn furnaces, and he believes the corn furnaces



successfully provided at least 80 percent of his heating needs until temperatures dropped below 10 degrees.

Rising corn prices and increasing challenges with cleaning the units caused Stam to reduce his reliance on the corn furnaces to about 60 percent of his heating needs in early 2008. He estimated that he burned just over 1000 bushels of corn for 2007-2008, compared to about 2200 bushels in earlier years.

He says the larger problem was the increased buildup of clinker (a hard-ash cake of burned corn) over the years. He says it took about a day to clean each unit in the beginning, and it wasn’t a problem if he didn’t clean them for a day or two. But he found he was spending 15 minutes per unit, no less than two times a day, chiseling the rock-hard residue from the burn chambers with a hammer and crowbar.

“It kind of gets to where at the end of an 18-hour day I don’t want to clean my corn stoves,” he says. “[Cleaning the units] is a more limiting factor for me than the price of corn.”

In the 2008-2009 heating season Stam reported he did not use the corn furnaces because of the clinker issue, price of corn and the rearrangement of his off-season growing area.

