



# Project Fact Sheet

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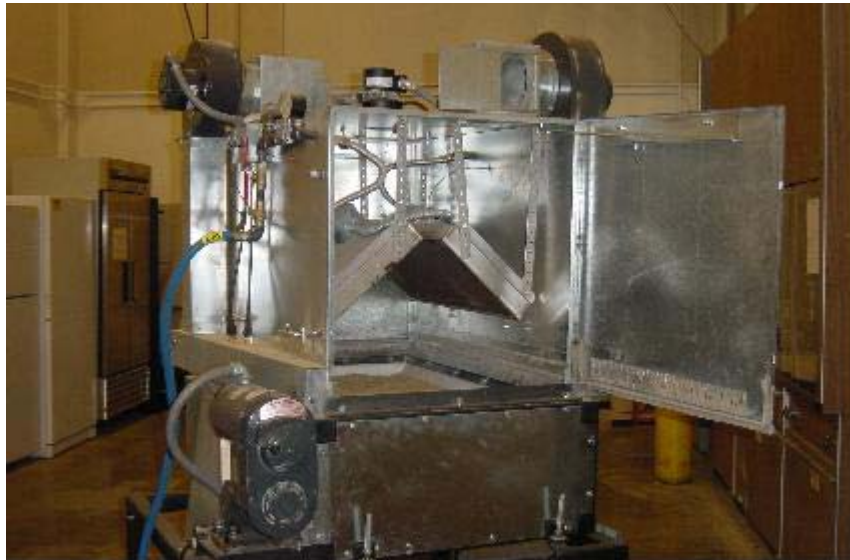
## *Infra Red Drying of Rice to Improve Energy Efficiency and Disinfestations*

### GOALS

- Evaluate the performance of laboratory scale Flameless Catalytic Gas-fired (FCG) infrared dryer and a Prototype Selective Wavelength (PSW) infrared dryer and determine optimum operating parameters for drying.
- Evaluate the disinfestations effectiveness of FCG and PSW infrared dryers.
- Compare the performance of laboratory FCG infrared dryer with an industrial dryer

### PROJECT DESCRIPTION

Conventional rice drying forces large volumes of hot air through deep beds of grain. This process depends on convection to transfer heat from hot air to grain surface and conduction to transfer heat to the interior of the grain. Infrared process heats the grain by radiation. Electromagnetic waves in the infrared band 3 to 10 microns penetrate up to 3 mm in to the grain and heats it faster and more effectively.



**Flameless Catalytic Infrared Dryer – Laboratory Model**

Infrared drying is not a new technology. Catalytic conversion of natural gas to infrared energy within the narrow and effective bandwidth is the new development that made the technology more energy efficient and more effective.

The project will use two types of laboratory infrared dryers to conduct experiments on infrared drying of rice. These tests will establish optimum operating parameters and effectiveness of infrared treatment on disinfestations and reducing microbial counts. A large scale dryer will be tested and the results compared with laboratory tests.

### **SITE BENEFIT**

A conventional column dryer uses 2,000 Btu of thermal energy to remove one pound of moisture, compared to 1,500 Btu using an infrared dryer. Conventional dryers use 7.7 kWh of electrical energy to dry a ton of rice while the infrared dryer uses on 1.6 kWh.

Replacement for a typical 50ton/hr column rice dryer by an infrared dryer is estimated to reduce 152,500 kWh/year of electrical energy consumption, 100 in peak demand and 12,000 therms per year in gas consumption.

### **INDUSTRY BENEFIT**

California has about 840 conventional rice drying facilities. Replacing column dryers with infrared dryers is estimated to achieve 84 MW of peak demand reductions and 128 million kWh savings in electrical energy consumption. Natural gas consumption reduction is estimated at 11 million therms per year. Additional environmental benefits will result from chemical free pest management practices and reduced particulate emissions.

### **FUNDING AMOUNT**

Project Cost: \$348,765

Public Interest Energy Research Program Contribution \$211,437 (61%)

### **FOR MORE INFORMATION**

<p><b>Jatal D. Mannapperuma</b> CIFAR, University of California, Davis (530) 752-8559 jdmannapperuma@ucdavis.edu</p> <p><b>Ricardo Amon</b> California Energy Commission (916) 654-4019 ramon@energy.state.ca.gov</p>	<p><b>Dr. Zhongli Pan</b> Biological and Agricultural Engineering University of California, Davis. One Shields Avenue Davis, CA 95616 (530) 750-2124 zlp@ucdavis.edu</p>
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