Walnut Drying

Keyawa Orchards

Left, Rooftop mounted SolarWall® system
Above, Funneled solar heated air into the walnut drying system

Background

Ron Keyawa is the founder and operator of a large walnut production & processing facility in Ordbend, California. He had previously seen another SolarWall® system operating at Carriere, a neighboring walnut producer, and with the success of that installation, Keyawa decided to incorporate a larger solar system into his processing facility during an expansion.

Solution

Walnut drying is ideally suited for the SolarWall technology. Walnuts require large volumes of heated air to reduce the moisture content to less than 8%. However, in order to maintain the proper flavor and texture, it is essential that the nuts are dried slowly using low level temperatures.

Ron Keyawa explains: *"To dry the nuts, I need air that's at 110℉, so if ambient is 80℉, then I need a 30° heat gain. At night, when things cool down here, I use a lot of natural gas! That's expensive—really expensive—so I looked for ways to reduce my energy costs and found SolarWall. Now there are times when I don't need to run natural gas at all because I'm getting enough heat from the SolarWall panels on the roof to shut off the burners*."

Results

The SolarWall® system was installed on the roof of Keyawa's new drying building. The system measures 9300 ft^2 (864 m^2), and provides 65,000 cfm of solar heated air to the air intake of the walnut dryer using traditional ducting. If the dryer is running at full capacity and more airflow is required, the bypass dampers can be used to supply additional air. Conversely, if the air from the panels is too hot, the bypass dampers will open automatically to cool the air to the desired temperature.

The SolarWall system is equivalent to a 500 kW heater. It displaces 1431 MMBTU of fuel and 92 tons of CO_2 emissions each drying season. In terms of cost savings, at the time of the installation—using *2003 natural gas prices*—the projected fuel savings were $13,832 each fall when drying occurs.

Commenting on the success of the system, Keyawa said: "*I'm currently designing the new building with one directional slope towards the south so that I can add SolarWall if I want, and grab more of the sun. I'm gearing up for the future!"*

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