

SYNOPSIS



**Owner : USDA AGRICULTURE
RESEARCH SERVICE, HOUMA,
LOUISIANA**

**Architect: RMF ENGINEERING,
BALTIMORE**

Area : Total 6353 SF

Completed June 2010

Costs: \$1.9M

GREENHOUSE



MATURATION & CROSSING FACILITY / SUGARCANE RESEARCH LABORATORY

The project started in June 2006 with the redaction of a program of requirements. The project included 3 distinct greenhouse facilities all dedicated to sugarcane research. The Maturation and Crossing Facility was built first while the other two larger greenhouses are scheduled for later construction. The structure and glazing had to withstand Category III hurricanes and was designed with an exo-skeleton providing the required rigidity while still allowing plenty of light in. This structure gives the facility a unique touch: it has an interior clearance of 23 feet to allow for the taller sugarcane plants. The greenhouse is divided into 3 individual compartments in addition to a connector to the headhouse currently under construction.

A total of 3 new independent compartments are provided. Compartments are maintained at their set points using only natural ventilation. Roof and side vents amount to slightly above 60% of the floor area. The result is a very good climate control provided by the individual modulation of every vent. One compartment (carts room) is fitted with an automatic blackout system. That compartment has large motorized garage doors opening to allow in 4 large heavy-duty carts rolling on embedded steel rails. The carts are motorized and automatically move in and out of the facility based on a programmable schedule.

The greenhouse roof is glazed with insulated aluminum panels, the exterior walls and the partition walls are glazed with 16 mm twin-wall acrylic sheets. Evaporative cooling is achieved through a fog system in each zone, independently controlled.

There is no bench at this facility. The maturation and the crossing compartments are fitted with unique cubicles made of a combination of rigid glazing and movable curtains. They are designed to receive different varieties of sugarcane together in the same cubicle for crossing purposes. Once the flowers have been fertilized, the plants are moved to the maturation compartment, where additional cubicles are provided.

Heating is done with hot water moving through radiant finned tubing installed at different heights on the perimeter walls. The hot water temperature is modulated through the use of control valves. An irrigation system is provided so to bring water to each cubicle through the use of multiple-head drippers.

The greenhouses are under control of a specialized, dedicated greenhouse computer control system with over 140 distinct input/outputs including weather station with sensors.