

# Bamboo Shade House

## Building a Growing Area for Summering Cattleyas

TEXT AND PHOTOGRAPHS BY TP PLIMPTON



**ABOVE** During the summer, a cattleya collection is hung in this 30 × 12-foot (9 × 3.5-m) shade house constructed from bamboo. An assortment of oncidiums and vandas, as well as begonias, are also housed in this airy pavilion.

**OPPOSITE** Having removed a large oak, the Plimptons built a shade house from bamboo already growing on their property. Drawing on their experience as landscape architects, they constructed the shade house in the fashion of a pole barn to create an environment suited to the needs of their growing collection.

**THE STORY OF THREE HURRICANES** and a shade house begins with a grove of timber bamboo. The grove is sited at The Whim, the former winter home of my grandparents, Oakes and Blanche Ames. Oakes (1874–1950) was a lifelong orchidologist at Harvard University, and his helpmate Blanche (1878–1969) was a botanical illustrator and portrait painter. Both were founding members of the American Orchid Society.

The Whim, located on the banks of the Halifax River in Ormond Beach, Florida, is now our home. My wife, Susie, and I were able to buy The Whim in 1987. When we show guests to our home the grove of timber bamboo, we often mention that it was planted by Oakes as a reminder of his work with orchids from the Philippines during the 1920s and 30s.

Through the years when we have had to cut the grove back to provide better lighting for our orchid greenhouses, we saved all the lengths of bamboo that range from 1½ to 3 inches (3.7 to 7.5 cm) in diameter and lengths of 35 feet (10 m) or more. Little did we realize how useful this collection would be until the summer of 2004 and the succession of three hurricanes.

The prize location for summer storage of our cattleya collection was in the perfect high shade of a huge live oak adjacent to the bamboo grove. The spread of the magnificent live oak covered an area 60 × 90 feet (18 × 27 m). Over 10 years we developed a whole system of hanging racks using bamboo and galvanized pipe supported by posts set into the ground. The 20-foot-(6-m-) long racks were separated by six alleys for access and watering. Come autumn, we'd move the collection into one of our greenhouses, leaving the bare racks to weather the winter. So when Hurricane Charlie threatened in 2004 we quickly stored the collection of more than 300 cattleyas in the greenhouse the day before the hurricane came through on August 12, 2004.



While the live oak survived without major damage, the lawn area was deep with 6- to 8-foot- (1.8- to 2.4-m-) long branches. Thankfully, the tough Lexan skin of the greenhouses survived all impacts. Not more than 300 feet (90 m) away, across Beach Street, the park at the river's edge was devastated. Three live oaks were downed along with 12 palms. Three ancient junipers were twisted as if by a tornado and the walkway to the dock was dislodged.

After storm debris had been cleared, we returned the orchids to their racks, expecting plenty of good weather. Alas, after three weeks of peace, Hurricane Frances threatened

and we had to repeat our emergency clearing of the racks. As the storm came through on September 5, 2004, we spent a long noisy night at the safe end of our house, taking no more chances that the live oak with its lean toward our bedroom might fall.

While the tree shed another load of litter, this storm made us realize the potential hazard of the live oak. With reluctance, we decided to cut the tree down. The oak had shown signs of stress and die-back because the previous owner had covered more than a third of the root mass with the foundation of a shop and garage. Sadly, we gave the word and the tree was cut

down to its 4-foot- (1.2-m-) diameter stump one day before the arrival of Hurricane Jeanne on September 24, 2004. Coming from the ocean, Jeanne finished destroying the dock and flooded over Beach Street, but caused no further damage to our property.

**DESIGN CONSIDERATIONS** Now that we had lost the entire orchid shade area, we set about to design an appropriate shade house. It had to be finished for the next growing season. We decided to use the bamboo. When we took inventory we found we could design the entire structure around bamboo materials at hand. Our use of bamboo on the existing racks over the



past 10 years showed us its durability — a 15-year life span is expected, especially if protected. We assembled the pieces of bamboo and sought to protect them from the ravages of sun and rain. Cabot Wood Cleaner was used as the cleaner primer and Cabot Australian Timber Oil was selected as the best covering for waterproofing. Aluminum flashing material provided covering over unprotected joints and open ends.

Shade structures were familiar to us. In our past work as landscape architects we had designed shade structures around swimming-pool terraces. One client allergic to the sun had specified 50 percent shade to get protection, a similar requirement for our orchids. Leaving the orchids in their winter quarters, we dismantled the hanging racks. By September 20th we had laid out the dimensions for a shade house.

We designed the shade house to be 30 feet (9 m) long and 12 feet (3.5 m) wide. In the tradition of a pole barn, we spaced the bamboo supports at 7½ feet

(2.2 m), arranged in three rows 6 feet (1.8 m) apart. The side support poles are 7 feet (2 m) high and the center poles 8½ feet (2.5 m) high. Each pole is supported on a concrete footing into which had been cast a 1-inch (2.5-cm) PVC pipe extending 18 inches (45 cm) up from grade. Each pole, with nodes drilled to receive the extended pipe, was slipped over the pipe and pinned in place.

**HOW TO** Construction began October 26, 2004, with the pouring of the footings and the setting of the poles. The two top plates, each a 32-foot (9.7-m) length of bamboo spanning the sides, were pinned to the side support poles with  $\frac{3}{16}$  inch (.18 cm) threaded rods with self-locking nuts. The center ridge pole, a 34-foot (10-m) length consisting of several pieces spliced together, was strapped down on top of the center support poles with straps designed to protect the upper end of each pole from the weather. The cross beams from side to side were bolted to the side posts underneath the top plates with  $\frac{3}{16}$ -inch (.18-cm) threaded rods.

Sway braces bolted with  $\frac{3}{16}$ -inch (.18-cm) threaded rods extend from side plate to bottom of poles in five locations, providing stability to the structure. Smaller 3-foot (.9 m) sway braces were mounted and bolted with  $\frac{1}{4}$ -inch (.6-cm) threaded rods at each corner and at the middle of each side from the posts up to the side plates.

We planned the shading to fit the design with standard 4 × 8-foot (1.2 × 2.4 m) shade panels: eight panels per side covered 32 feet (9.7 m), giving a 12-inch (30-cm) overhang at each end and a side-to-side overhang of 18 inches (45 cm). The roof pitch is  $\frac{3}{12}$  or 14 degrees.

By December 14, 2004, we began assembling the shade panels. Each panel was constructed of 24 8-foot (2.4-m) lengths of split 1-inch (2.5-cm) bamboo spaced 1 inch (2.5 cm) apart, secured at each end to 4-foot (1.2-m) headers of 1-inch (2.5-cm) bamboo. The 1-inch (2.5 cm) bamboo, purchased in bundles of 50, was the one exception of having to buy bamboo off site (from [www.bamboofencer.com](http://www.bamboofencer.com)).



After experimenting with various ways of splitting, we found a table saw to be the best tool for a clean cut. Each end of the split bamboo was secured to the headers with a stainless 1-6 pan-head screw. A frame jig was used to hold each header while the 24 lengths of bamboo were spaced exactly 1 inch (2.5 cm) apart. By January 4, 2005, we celebrated the completion of the 16 shade panels.

When mounting each shade panel in place, opposite headers at the ridge were secured to S-hooks resting on the center ridge pole. The headers at the lower end hung over the side plates as eaves. Each shade panel was secured to the side plate with plastic ties around two individual split bamboo lengths at each side. In the event of future hurricanes, the plastic ties can be cut to allow easy removal of the panels. By March 3, 2005, we had completed erecting the frame of the shade house.

On March 31st, it was time to move the cattleya collection into its new home along with oncidiums, dendrobiums and vandas. A special rack was extended out from the shade panels on the south side to gain more sun for hanging oncidiums and vandas. Two tiers of hanging racks were spaced on two levels in the two alleyways. Using galvanized turkey wire, we fabricated two hanging frames on the north side for smaller pots and mounted specimens. Two benches of begonias were placed at the west end of the shade house.

Access from the nearby green-



house is convenient for extending water service, using our 200-gallon (750-L) rainwater supply for both watering and fertilizing. The lawn under the shade house is easy to maintain, as the mower can maneuver around the poles.

One piece of furniture has been acquired for the shade house — a cart on wheels with an 18 × 24-inch (45 × 60-cm) tabletop that is equipped with tools for on-the-spot grooming and maintenance of plants. The handy cart is stored in the nearby greenhouse, ready for use when making the rounds.

No sooner had everything settled in than we noticed our first tenant, a mourning dove with her nest in a 10-inch (25-cm) pot of *Epidendrum ciliare*. She had already bred one hatchling and was working on a second.

**STANDING STRONG** The shade house has shown to be a great success with many different exposures, depending on closeness to the shade panels and which side for early or late sun. In July 2005 we had a real wind test for the shade house from a thunderstorm. From our office window we watched the wind gusts as the rain whirled through the shade house. The next morning we inspected the orchids and found no damage, despite the fact that the wind had brought down two 25-foot- (7.6-m-) tall stalks from our bamboo grove and tree branches from nearby trees. The bamboo stalks will be stored for future use.

At the tail end of the 2005 hurricane season, Hurricane Wilma caused us to activate our safety plan of storing all

OPPOSITE The new shade house is adjacent to a Lexan greenhouse where the cattleyas are kept during the winter. The center ridge pole of the bamboo structure, measuring 34 feet (10 m) long, is made up of several pieces of bamboo spliced together.

ABOVE LEFT A piece of wire mesh hung vertically increases growing space for potted orchids as well as a few mounted specimens. The wire allows for plenty of air circulation among the plants, and makes it easy to water.

ABOVE Each pole is supported on a concrete footing into which had been based a 1-inch (2.5-cm) PVC pipe extending 18 inches (45 cm) up from grade. The lawn beneath the shade house is mowed regularly.

orchids in the greenhouse. The storm passed through offshore on October 24, 2005, with wind gusts clocked at 40 to 60 miles per hour, and dumping 4 inches (10 cm) of rain in our area. The shade house, with shade panels still in place, came through with flying colors, even housing a few hardy oncidiums and vandas in the sheltered end of the house.

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