Building a Pergola in a Demonstration Garden

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ADDITIONAL INDEX WORDS. Master Gardener, Florida Yards and Neighborhoods program, garden demonstration

The Polk County residential horticulturist and the Florida Yards and Neighborhoods program assistant have been working for several years on various demonstration gardens at the Extension office in Bartow. There currently are butterfly, turf, wildflower, palm, rose, and native plant demonstration gardens. Master Gardener volunteers suggested that the construction of a pergola would enhance and tie together several of the gardens, and could be used as an outside teaching classroom as well as a structure to display native vines. The first step was to make a basic design and model from which a list of necessary materials could be developed. Funding was the next serious consideration, as it was quickly realized that the pergola would cost well over $2000. Lowes Inc. in Bartow offered to supply, at no cost, a large portion of the materials. The Master Gardeners contributed the remainder of the necessary construction funds. The basic aboveground structure was made of an assortment of pressure-treated wood and the floor was made of flagstones laid in sand. The basic structure was completed in Fall 2006. During the construction phase numerous drainage problems had to be addressed and solved. Plants, consisting of vines and shrubs, were selected and planted in Spring 2007. All of the labor for this project was donated by Master Gardener volunteers.

A pergola is defined as a garden walk or terrace, typically formed by two rows of columns or posts roofed with an open framework of beams and cross-rafters over which plants are trained. Its purpose is to provide a foundation on which climbing plants can be viewed and to give shade. Known in ancient Egypt, pergolas were a common feature of early Renaissance gardens in Italy and subsequently throughout Europe. They had a marked revival during the Arts and Crafts Movement in Great Britain (Encyclopedia Britannica, 2007). The Polk County Master Gardeners felt that such a structure would enhance and beautify the demonstration gardens at the Polk County Extension Office in Bartow, FL.

Materials and Methods

TOOLS. The tools needed for construction of the pergola included shovels, circular saw, hammers, wrenches, level, square, electric drill and bits, screwdrivers, stepladders (8 and 10 ft), tape measure, string line, jig saw, template for contoured ends, table saw (not essential), sledge hammer, 5-gal bucket and hose, paintbrushes, and wheelbarrow.

WOOD AND ACCESSORIES. All wood used for the construction of the pergola was pressure treated for protection against termites and wood-decaying fungus. The wooden construction materials included twenty-four 4 × 4 × 10-ft pressure-treated boards, seventeen 2 × 4 × 16-ft boards, eight 2 × 4 × 10-ft boards, seven 2 × 4 × 8-ft boards, six 2 × 12 × 16-ft boards, four 4 × 8-ft sections of ½-inch lattice, twenty-five 1 × 4 × 8-ft boards, two 1 × 2 × 8-ft boards, two 1 × 6 × 8-ft boards, one 1 × 6 × 12-ft boards, and one 1 × 6 × 10-ft boards. Total cost for the wood was $1200. Other materials associated with the aboveground structure included 5 gal of weather sealant, 5-inch carriage bolts, nuts and washers, 10 lbs of 3½-inch deck screws, and 50 hurricane ties. The miscellaneous items cost $300.

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middle sections of the pergola on the east and west sides. This lattice finished off the pergola so that there were 8-ft openings on the north and south ends and two 2-ft openings on the east and west sides (Fig. 4).

**Step 6.** It was decided that the floor would consist of flagstones set in sand, and there would be a walkway from each end of the pergola—one connecting to a common sidewalk and the other leading to a fountain set in river rock. The outline of the floor was edged with 1 × 6-inch boards. Four inches of the existing soil was excavated and replaced with builder’s sand, which was compacted with a hand compactor. The flagstones were then set in the sand. Cracks and open spaces between the flagstones were filled in with the same builder’s sand (Fig. 5).

**Step 7.** There was concern that the lath edges of the lattice would separate through wear and tear and need replacement in a couple of years. Therefore, 1 × 5-inch boards were installed on all edges of the lattice.

**Step 8.** All of the finished wood was painted with a common wood sealant.

**Step 9.** The last and final phase of the pergola was the installation of plants. As of the writing of this paper, this task was only

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**Fig. 1.** Installation of two 2 × 12 × 16-ft boards onto four 4 × 4 × 12-ft end posts on the east and west sides of the structure.

**Fig. 2.** Installation of four 2 × 12 × 16 notched boards positioned perpendicularly over the east and west joists.

**Fig. 3.** Installation of fifteen 2 × 4 × 16-ft boards spaced evenly over the four 2 × 12 × 16-ft joist boards.

**Fig. 4.** Installation of lattice on all four sides of the pergola.

**Fig. 5.** Floor composed of flagstones set in compacted masonry sand.
partially completed. Pineapple guava plants were placed on each side of the walkway leading into the pergola. Four cross-vines were placed at the rear corners and four East Carolina jasmine were placed at the front corners of the pergola (Fig. 6). Plans are being made to install various native perennials and bunch grasses.

Discussion

The pergola took about 1½ years to build, which is not surprising as most of the labor was donated by Master Gardener volunteers. The top of the pergola appeared to be slightly top-heavy so narrower boards could have been used for the top trusses, such as a 2 × 10 × 16 or a 2 × 8 × 16. The original plan called for seven 2 × 4 × 16 ft boards on the top about 2 ft apart, but this spacing seemed wide so eight more 2 × 4 × 16 boards were added to bring the spacing closer to 1 ft. In general, the construction techniques on the top seemed very adequate.

The lattice finish on the sides really made the structure stand out, but 2 × 4 × 8 ft vertical boards had to be added to the pergola as supplementary lattice attachment boards. Sections of lattice often come apart at the edges after a year or two of weathering, so 1 × 5 × 8 boards were secured to each outside edge. The boards were overlapped at each corner so none of the lattice edges were exposed.

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Literature Cited