

TROPICAL FRUIT URBAN FORESTRY AT THE WHITMAN TROPICAL FRUIT PLAZA OF FAIRCHILD TROPICAL BOTANIC GARDEN

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Abstract. South Florida horticulture continues to evolve. Changes are due to urbanization, governmental regulation, foreign competition and the needs of the growing community. An urban forestry project was initiated in 2004 at FTBG in conjunction with the Whitman Tropical Fruit Pavilion. This project provides the home owner and estate gardener with examples of tropical fruit in the urban landscape. The formal landscape design has been important to the success of the project and is built around a central plaza with plantings of economically important (including fruit) crops radiating out of a central point. Carambola and guava have been a successful display element as a mirrored espalier planting to frame the plaza and demonstrate a novel method for estate gardening. The use of superior clonal material has been vital to the success of the project, allowing for precocious flowering and fruiting of a range of species. Furthermore, the use of dwarf clones and horticultural management to control size of sapodilla, jackfruit, mamey sapote and mangos have added considerable impact to the project. The project continues to evolve in both species selection and horticultural management; however, early response to the project shows considerable potential for public impact both in urban forestry and estate gardening.

South Florida has for over a century boasted a small, but locally important tropical fruit industry, and has served as an invaluable resource for tropical fruit innovations for the tropical world. South Florida continues to evolve, with increased urbanization, environmental legislation, environmental concerns and marketing challenges for tropical fruit crops. The tropical fruit industry must also evolve with these challenges to remain economically viable.

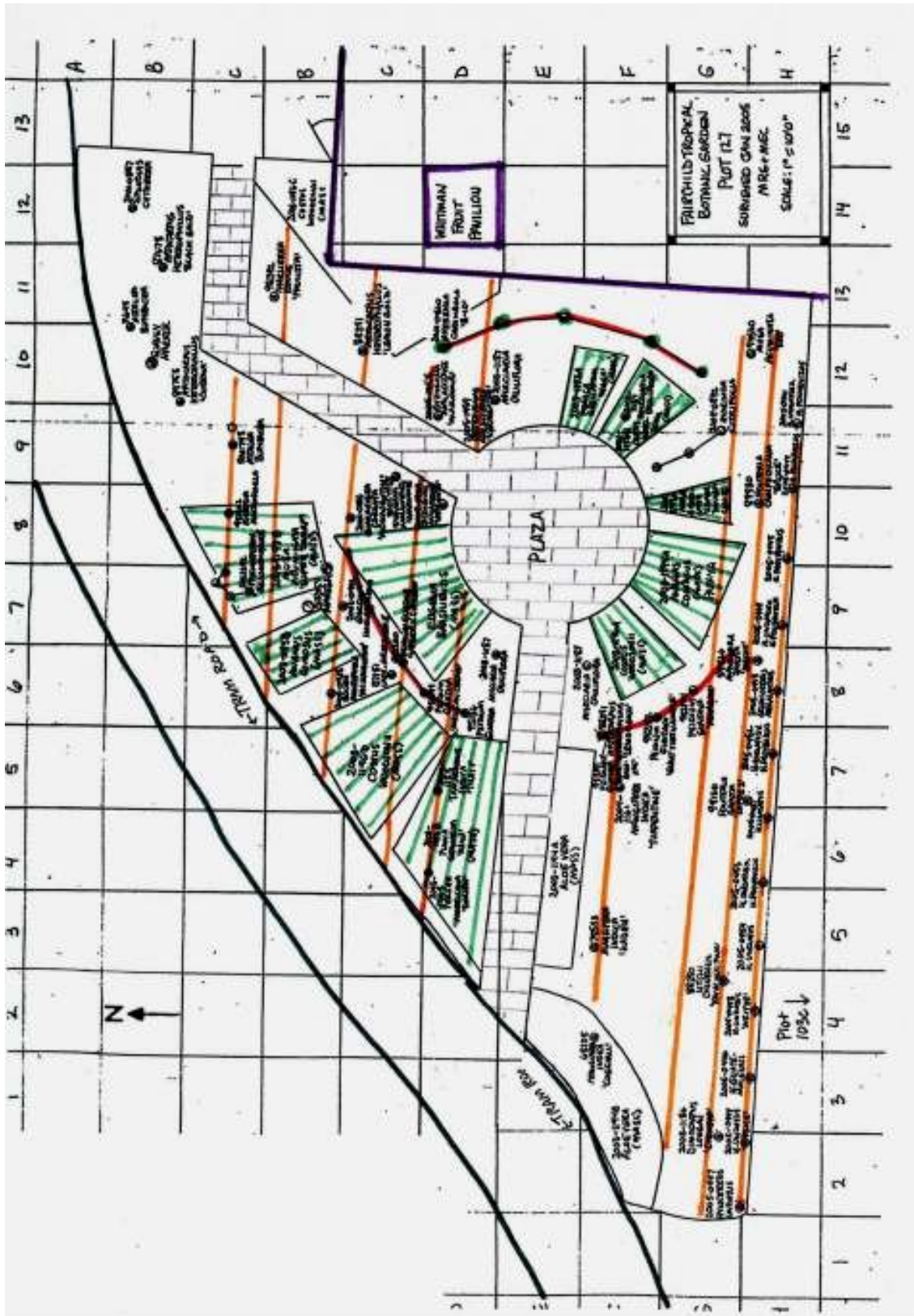
In 2001, Fairchild Tropical Botanic Garden received an endowment from Mr. William F. Whitman to enhance its work on exotic tropical fruit and estate gardening. Mr. Whitman is a noted plant collector and one of the founders of the Rare Fruit Council International. The endowment was used to construct an environmentally-controlled pavilion and various positions within the Tropical Fruit Program of FTBG. The Whitman endowment served as seed money for urban forestry projects funded by the State of Florida focused on the use of tropical fruit trees in the home landscape.

The objective of this paper is to describe the first of our urban forestry projects with tropical fruit, conducted in conjunction with the Whitman Pavilion within the public garden at FTBG.

Landscape and Conceptual Design

A formal landscape design is central to the success of the Whitman tropical fruit plaza and the entire urban forestry project (Fig. 1). There are three basic components to the landscape design; radiating plots of economic crops, transecting rows of select fruit trees and a synopsis of the FTBG Tropical Fruit Program. The radiating plots of economic crops are the heart of the formal design. The plots of economic crops radiate out from the central point of the plaza, like wedges of a pie. These plots are planted with low-growing crops such as edible costus, pomegranate, pineapple, peppers, papaya, and

various species of Myrtaceae. The plots are changed with the season according to horticultural and interpretation demands. The lines between and within each plot are strictly maintained in order to reinforce the formality of the design.



Superimposed on the radiating plot design are transecting rows of select fruit trees, planted on a 4 m grid. These select fruit trees provide the upper canopy for the plaza display and the interpretive story for the South Florida urban landscape. Included in this component of the landscape design are avocado (*Persea americana*), tamarind (*Tamarindus indica*), persimmon (*Diospyros kaki*), charachuela (*Garcinia* sp.) and jackfruit (*Artocarpus heterophyllus*).

The final component of the landscape design is a synopsis of the Tropical Fruit Program of FTBG, as told through specific fruit trees, cultivars and horticulture. This component of the landscape contains mango (*Mangifera indica*), canistel (*Pouteria campechiana*), sapodilla (*Manilkara zapota*), mamey sapote (*Pouteria sapota*), lychee (*Litchi chinensis*), longan (*Nephelium longana*), black sapote (*Diospyros digyna*), abrico (*Mammea americana*) and caimito (*Chrysophyllum cainito*).

Innovations with Horticulture

Proper horticulture is central to the success of the project, and relies on innovations and the proper use of clonal selection, dwarfing through cultivar selection or novel propagation techniques, pruning and interpretation.



Fig 2. Guava (*Psidium guajava*) are used in an espalier



Fig 3. Clonal selection in jackfruit

Fruit Plaza include considerable use of tree training and espalier. Carambola (*Averrhoa carambola*) and guava (*Psidium guajava*) are used in an espalier system that provides the visitor with a novel use of these dooryard species. The espalier training system also serves as an effective design component of the display. Malay apple (*Syzygium malaccensis*) is another fruit trained in a novel manner to deliver our message; used as an arbor for entry into the central brick plaza.

Specific clones of each tropical fruit within the display are used to tell the interpretive story. Careful selection has been made for all crops, from pineapple to peppers to assure that our interpretive message is delivered. In terms of the fruit trees, only grafted, clonal material has been used to achieve precocious fruiting, a known sex and cultivar, and a manageable tree. Surveys taken within the plaza demonstrate a general lack of knowledge among the visitor in the area of grafting and the use of clonal material. The interpretive messages throughout the project reinforce the cultivar concept as a necessary component for urban forestry and estate gardening.

Dwarf fruit trees are a central concept within the Whitman Tropical Fruit Plaza. Dwarf clones of many fruit trees are used where available, such as the 'Makok' sapodilla (Campbell, 2000). However, where dwarf clones are not available, novel propagation techniques (Wasielowski and Campbell, 1999;

Wasielowski and Campbell, 2000) have been used to provide the desired effect. Interpretation throughout the display is developed to emphasize the use of dwarf clones.

A rigorous pruning program is combined with the use of proper clones to provide a strong visual message of size control and precocity (Wasielowski and Campbell, 1999b). Pruning is used in all three of the major design components of the display. Pruning is also a central theme to the interpretation throughout the display; presented as a vital component to the success of any urban forestry project.

The Whitman Tropical Fruit Plaza has been fully planted for less than 2 years, but has proven a valuable complement to the Whitman Pavilion project at FTBG. The display has been used not only as an effective public display, but also as a vehicle for funding and seed money for other urban forestry projects. The display is not static, but is in a constant state of change to accommodate changes in interpretive needs and response to hurricanes and other natural occurrences. The effectiveness of the display will only increase as the project matures.

Table 1. Plant list for the Whitman Plaza at Fairchild Tropical Botanic Garden, Coral Gables, FL. June, 2006.

Accession Number	Scientific name	Common Name	Cultivar
2003-1195*B A	<i>Ananas comosus</i>	Pine apple	-
87678*B A	<i>Artocarpus heterophyllus</i>	Jackfruit	'Black Gold', 'Cheena'
2002-0938*A A	<i>Bouea macrophylla</i>	Maprang	'McNaughton'
2003-1196*D A	<i>Costus woodsonii</i>	Costus	-
2002-0942*B A	<i>Garcinia hombroniana</i>	Luli	-
2003-1197*B A	<i>Musa acuminata</i>	Banana	'Super Dwarf', 'Dwarf Cavendish' 'Red', 'Dwarf Namwa', 'Ae Ae'
2003-1187*A A	<i>Myrciaria cauliflora</i>	Jaboticaba	'Sabara'
2003-1768*C A	<i>Persea americana</i>	Avocado	'Darien'
982199*A A	<i>Psidium guajava</i>	Guava	'Mexican Creme', Weber X Supreme'
2003-1193*B	<i>Punica granatum</i>	Pomegranate	'Nana'
2001-0856*A A	<i>Quararibea cordata</i>	Chupa Chupa	'McNaughton'
981345*A A	<i>Rheedia macrophylla</i>	Charachuela	-
2001-0857*B A	<i>Spondias cytherea</i>	Ambarella	-
2005-1958*B A	<i>Syzygium malaccense</i>	Malay apple	'Maroone', 'Variegated'
2003-1183*A A	<i>Tamarindus indica</i>	Tamarind	'Thai 1'
88291*B A	<i>Artocarpus heterophyllus</i>	Jackfruit	'Lemon Gold'
2001-0860*E A	<i>Averrhoa carambola</i>	Carambola	'B-10'
2003-1186*A A	<i>Dimocarpus longan</i>	Longan	'Chompoo'
2005-0444*A A	<i>Hylocereus</i> sp.	Dragon Fruit	'Alice', 'Neitze'
88290*A Q	<i>Litchi chinensis</i>	Lychee	'Kwai Mai Pink'
68225*A A	<i>Mangifera indica</i>	Mango	'Cogshall' 'Haden' 'Number 11' 'Turpentine'
89866*A A	<i>Manilkara zapota</i>	Sapodilla	'Makok'
2004-0892*C A	<i>Morinda citrifolia</i>	Noni	-
2003-1187*B A	<i>Myrciaria cauliflora</i>	Jaboticaba	-
2003-1185*A Q	<i>Pouteria caimito</i>	Abiu	'Gray', 'Whitman'
89930*A A	<i>Pouteria campechiana</i>	Canistel	'Bruce'
991341*A A	<i>Pouteria sapota</i>	Mamey sapote	'Lopez 2'
982194*A A	<i>Psidium guajava</i>	Guava	'Alhabari', 'Giant Bangkok' 'Giant Vietnamese'
2003-1190*A Q	<i>Rheedia acuminata</i>	Charachuela	'Turrialba'
2002-0935*A A	<i>Sandoricum koetjape</i>	-	'Manila'
2002-0944*A Q	<i>Theobroma grandiflorum</i>	Cupuacu	-

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