set by the school system. Teacher response to this programming effort has been substantial.

The extension home economics program is involved in many food and nutrition programs. Aside from utilizing much of the fruit from the garden for demonstrations and other cooking-related programs, a program entitled "A Taste of the Tropics" is held at least twice a year. Fruit from the garden and other sources are displayed to the public, along with samples and prepared foods from these fruits. This program has been very successful in exposing thousands of people to the pleasures of eating the fruit, as well as practical uses for these nutritional foods.

Summary

In terms of educational impact, the garden's potential in supporting ongoing horticultural programs of extension, is now beginning to be realized.

The effort of developing such expanded demonstration gardens is one which every extension office and/or municipality should seriously consider. Aside from the programming possibilities it affords, the demonstration areas allow residents to participate in the design and plant selection decisions in a knowledgeable manner.

The ability to recognize a plant's form and function in the landscape is imperative in decisions regarding their intended use. A facility which allows such a practice is an invaluable asset to residents and the community at large.

Proc. Fla. State Hort. Soc. 101:136-139. 1988.

REINTRODUCTION OF FLOWERING TREES TO SOUTH FLORIDA

DAVID E. WEDGE
West Palm Beach Parks and Recreation Advisory Board
1044 Macy Street
West Palm Beach, FL 33405

Additional index words. Carpodiptera ameliae, Cassia javanica, Cassis spectabalis, Chamaefistula antillana, Lagerstroemia loudonii, Lagerstroemia tomentosa, Lagerstroemia turbinata, Stereopernum kunthianum, Tabebuia impetiginosa.

Abstract. **An organized multiphased approach is being used to reintroduce flowering trees into the south Florida landscape. The park system and the street tree planting programs are being used by the City of West Palm Beach as a vehicle in which this takes place. Flowering trees can then be viewed and enjoyed by the residents, thereby creating the desire for these trees to be grown by homeowners and the commercial nursery industry. By specifically targeting certain high potential and low incident flowering trees, large enough populations of seedlings can be raised for both the city nursery and local commercial nurseries. By employing this method of using both public and private sectors of reintroductions of flowering trees, it is hoped that this program will have an increased rate of success.**

In 1986-1988 a unique group of individuals was laying the ground work which eventually became known as the DYNAMIC VISIONS an environmental/landscape report for the City of West Palm Beach. One specific area of that report concerned landscaping with flowering trees. West Palm Beach's proximity to the warm Intracoastal Waterway, prevailing 6 mph southeasterly breeze, and an average rainfall of 60 inches offers a climate unexcelled for the use of flowering trees in the landscape. The goal was to use flowering trees as accent speciments. To make a definitive landscape statement of a specific color, at a specific time, in the proper location.

As the city grew to the west that favorable environment began to change. The annexation of western suburbs, brought in colder winter temperatures, more rainfall, and poorer draining soils (1). Many of the old standard flowering trees could no longer tolerate the cold temperatures, or the poor drainage. As a result a search was started to find specimen trees in Florida that were adaptable to these locations, acquire seed from these trees, begin a propagation plan, and eventually a planting program.

Availability of new and different flowering trees was an immediate problem (2). In the landscape trade the foremost Catch-22 exists. The nurseries don't grow what the landscape architects don't design, and the landscape architects don't design what the nurseries don't grow. To make the problem worse most of the landscape architects are trained in temperate climates and are unfamiliar with sub-tropical flowering trees. Commercial nurseries wanting to maintain a strong economic return on their investment don't desire to become pioneers in the flowering tree trade.

As a result individuals within the public sector decided to locate, collect, propagate, and plant flowering trees back into the landscape. This resulted in what became the Flowering Trees Program for the City of West Palm Beach which hopes to eventually grow 35,000 seedling trees. These young seedlings will eventually become the mainstay for the street tree planting program, and be the source of specimen and accent trees in neighborhood parks, school yards, and other public facilities. Through the use of the park system, which is always in need of trees, low incident flowering trees seldom seen in south Florida can be reintroduced into the landscape. By increasing the visibility and frequency of appearance of specific species, thousands of individuals can view these trees from the municipal showcase, thereby generating a desire for these trees to be grown by the homeowner and the commercial nursery industry. An example of this phenomenon is seen in the spring with *Tabebuia argentia* (*T. caraiba* (A. Gentry)) (3) the most widely cultivated yellow flowering *Tabebuia* in Florida. In the fall of the year the golden rain tree, *Koeireuteria fromosana*, not only shows off its bright yellow flowers, but continues the display with beautiful bright pink seed pods. When these trees come into flower they stimulate thousands of phone calls to the local extension office and university botany departments. By employing this method of using both the public and private sectors for the rein-

troduction of flowering trees, it is hoped that this program will have an increased rate of success.

Dr. Edwin Meninger wrote in 1958 "The beautification of the homes and highways of Florida has to be done by the people who live here. It requires a special effort to learn about and to grow the extra beautiful things that are available from the world tropics. This job of getting acquainted with newcomer trees is ours-yours and mine. Let's stop being provincial. Let us lift our eyes to new horizons, awaken to the fact that literally thousands of new and beautiful trees are available to us, but nobody is going to bring them over and plant them in your yard or your town. The responsibility is on your shoulders."

Thirty years later we have done little if not degressed in the use of flowering trees in the landscape. If the readers of this paper are interested in becoming involved in the West Palm Beach Flowering Tree Program, please contact the author at the published address. The viability of this program depends on new and varied seeds sources from all over the world.

High potential and low incident incident flowering trees currently being selected fo south Florida:

Note: Degrees Fahrenheit: dF
Importance: Scale from #1 to #5, #5 being the hightest.
USDA Miami: United States Department of Agriculture Subtropical Horticultural Research Station
Foliage Char.: Foliage Characteristics
Flower Char.: Flower Characteristics
Flwr. Season: Flower Season

Nomenclature *Carpodiptera ameliae*	Tilaceae
Common Name	Mountain-pear
Height	30-40 feet, Large spreading tree
Growth Rate	Moderate
Hardiness	25 dF, never tested locally
Plant Type	Evergreen
Foliage Char.	Dark green, large elliptic leaf to 12"x7"
Flower Color	Lavender/rose
Flower Char.	Profusion of panicles of thousands of flowers masking leaves
Flwr. Season	Late July and August
Nutrition	Wide range
Uses	Accent, park, perimeter plantings, ideal for golf courses
Sources	USDA Miami, native to Belize (British Honduras) and Mexico
Germination	Seeds only germinate well under intermittant mist, mixed media
Importance	#5, Very unique tree, has good potential for colder areas, and blooms in the late summer when color is needed

Nomenclature *Cassia javanica* (4)	Caesalpinacea
Common Name	Apple-blossom senna
Height	30-40 feet, large open spreading tree
Growth Rate	Moderate
Hardiness	25 dF
Plant Type	Deciduous
Foliage Char.	Green, compound eaves to 12"
Flower Color	Bright pink and white floral displays
Flower Char.	2" flowers in dense heads on branches behind the leaves
Flwr. Season	May to June
Nutrition	Wide range
Uses	Accent tree, park, residence, and buffer plantings
Sources	USDA Miami, native to Malaya
Germination	Very mixed germination rates over a years time
Importance	#3 beautiful tree in bloom, seldom used in the West Palm Beach area, has potential for western urban areas

Nomenclature *Cassia spectabalis* (4)	Caesalpiniacae
Common Name	Calceolaria shower
Height	60 feet, open spreading tree
Growth Rate	Fast
Hardiness	25 dF
Plant Type	Deciduous
Foliage Char.	Light green, compound leaves to 9"
Flower Color	Bright yellow
Flower Char.	2" flowers on up to 2 foot trusses above the tree canopy
Flwr. Season	October and November
Nutrition	Wide range
Uses	Accent, park, residence, and buffer areas
Sources	USDA Miami, native to Brazil
Germination	Poor mixed germination rate over a year in time
Importance	#2 seldom seen in the landscape, tree is somewhat sprawling when young. but has good potential

Nomenclature *Chamaefistula antillana* (4)	Caesalpiniaceae
Common Name	West Indian shower
Height	10-15 feet
Growth Rate	Fast
Hardiness	25 dF, depending on environmental conditions
Plant Type	Evergreen
Foliage Char.	Light green pinnate leaves with two pairs of road leaflets
Flower Color	Bright yellow
Flower Char.	Flowers in terminal clusters and leaf axils
Flwr. Season	Winter, Nov. to April
Nutrition	Wide range, will endure drought and poor soils
Uses	Accent, park, residence, and perimeter plantings
Sources	West Palm Beach city parks
Germination	Seed germinations poor, mature cuttings preferred
Importance	#5 An excellent long winter bloomer, very durable tree Tree has unpresidented use for golf courses and high visibility areas

Nomenclature *Lagaerstroemia loudoni* (4)	Lythraceae
Common Name	Loudon's crape myrtle
Height	20-3 foot tree, upright and open tree
Growth Rate	Slow to moderate
Hardiness	29 dF, has survived all freezes in West Palm Beach, in past 40 years
Plant Type	Deciduous
Foliage Char.	Green with bronze cast, leaves are pubescent and soft

Flower Color	Light and dark lilac flowers 1-1.5 inches across
Flower Char.	Profuse bloomer, flower spikes 18-24 inches long
Flwr. Season	Spring, usually first week of May
Nutrition	Wide range
Uses	Accent, park, residence, and perimeter plantings
Sources	One tree in West Palm beach, and one at Fairchild Tropical Garden
Germination	Difficult, mixed media, seed must remain damp and not dry out
Importance	#5, This beautiful tree needs to be preserved first, then used in public park systems and as specimen accent trees

Nomenclature *Lagerstroemia tomentosa* (4) Lythraceae

Common Name	Fuzzy crape myrtle
Height	50-60 feet, large Indian tree
Growth Rate	Moderate
Hardiness	20 dF
Plant Type	Deciduous
Foliage Char.	Green, roughly pubescent, new growth has a silvery sheen
Flower Color	White
Flower Char.	Flowers of 1-1.5", born on axillary panicles
Flwr. Season	Spring, April to May
Nutrition	Wide range, likes slightly acid soils, needs minor nutrients
Uses	Park, golf courses, areas where it has space to grow
Sources	USDA Miami, Siam
Germination	Poor, same as for othe crape myrtles
Importance	#3, Should be used more extensively, tree has good potential

Nomenclature *Lagerstroemia turbinata* (4) Lythraceae

Common Name	Burmese crape myrtle, (= late crape myrtle (4))
Height	25-30 feet, tall upright tree
Growth Rate	Fast while young, as much as 4 feet
Hardiness	22 dF
Plant Type	Evergreen
Foliage Char.	Green, with exfoliating bark
Flower Color	Lilac fading to pink and white
Flower Char.	Copious axillary panicles, flowers about 2" across
Flwr. Season	October to November
Nutrition	Wide range, prefers slightly acid soils
Uses	Accent, park, residence, perimeter plantings
Sources	T. T. Sturrock, originally introduced by Harvard Botantical Garden
Germination	Seed germination rate good, mixed damp media
Importance	#5, A good evergreen fall bloomer, timber quality tree, hurricane resistant and cold tolerant

Nomenclature *Lonchocarpus griffonianus* (4) Papilionaceae

Common Name	Giffon lancepod
Height	20-30 feet
Growth Rate	Slow
hardiness	25 dF
Plant Type	Evergreen, weeping habit
Foliage Char.	Green, pinnately compound leaf to 8"
Flower Color	Lilac-purple/blue
Flower Char.	Profusion of wisteria like flowers on upright trusses
Flwr. Season	October to November
Nutrition	Wide range
Uses	Premium accent tree, residence, park, courtyard areas
Sources	West Palm Beach park system, native to Africa
Germination	Seed germination good, seedlings are slow growers
Importance	#5, Beautiful trees, soft pale lilac blue, feathery dainty foliage completing a floral marvel (5)

Nomenclature *Stereospernum kunthianum* (4) Bignoniaceae

Common Name	Pink jacaranda
Height	15-30 feet, of wet savanna country, also thrives in dry areas
Growth Rate	Slow to moderate
Hardiness	24 dF, seems to be very drought tolerant
Plant Type	Evergreen, tall slender form
Foliage Char.	Green, pinnate leaves to 1 foot, ovate leaflets 5x2.5 inches
Flower Color	Bright mauve flowers
Flower Char.	Large drooping clusters on old wood
Flwr. Season	Spring and Fall, seems to follow rain fall like Tabebuias do
Nutrition	Wide range, tree survives in poor nutritional soils
Uses	Accent, park, median plantings, good street tree potential
Sources	West Palm Beach Park System
Germination	Good, mixed media, sow like Tabebuia
Importance	#5, Tremendous trees for reforestation and cleared canal banks. Excellent tree for streets and highways, pedestrian pathways

Nomenclature *Tabebuia impetiginosa* (3) Bignoniaceae

Common Name	Ipe roseo
Height	25-35 feet
Growth Rate	Moderate
Hardiness	25 dF, grown at Walt Disney World
Plant Type	Deciduous, open habit
Foliage Char.	Green palmate leaf
Flower Color	Pink to magenta
Flower Char.	Trumpet flowers 2-2.5" with yellow corolla
Flwr. Season	March to April, these trees exhibit the big bang effect (3)
Nutrition	Wide range, likes high soil moisture
Uses	Accent, residence, park, perimeter planting
Sources	Walt Disney World Nursery, Kim Warneke horticulturist
Germination	Seeds must be planted ASAP after collection; embryo drys out
Importance	#4, Ipes increased cold tolerance and preference for damp soils is significant for westward growth of our community

Nomenclature *Tabebuia impetiginosa* (3) Bignoniaceae

Common Name	Palmer's trumpet
Height	40-60 feet
Growth Rate	Fast
Hardiness	24 dF, more drought tolerant than Ipe roseo
Plant Type	Deciduous from December to March
Foliage Char.	Green palmate leaf
Flower Color	Magenta to wine red with bright yellow corolla
Flower Char.	2-2.5" trumpet flowers usually in clusters
Flwr. Season	Late Novemberr to December
Nutrition	Wide range
Uses	Accent, park, residence, perimeter plantings, golf courses
Sources	USDA Miami, Palm Beach County park system
Germination	Seed matures in February, germination is difficult in winter
Importance	#5, This tree has great potential for use as a winter bloomer and in energy landscaping for winter sun and summer shade

Literature Cited

1. Hodyss, Loretta B. 1986. Hardiness of landscape plants in Palm Beach County. Proc. Fla. State Hort. Soc. 99:162-164.
2. Will, A. A. Jr. 1986. Designing flowering trees into the landscape. proc. Fla. State Hort. Soc. 99:178-180.
3. Gentry, Alwyn H. 1982. The Genus Tabebuia. Proc. Menninger Flowering Tree Conf., p. 52-79.
4. Menninger, Edwin A. 1958. What flowering tree is that? Southeastern Printing Co. Inc., Stuart, FL.
5. Menninger, Edwin A. 1962. Flowering trees of the world. Hearthside Press Inc., NY.

Proc. Fla. State Hort. Soc. 101:139-144. 1988.

CHINESE WATERCHESTNUTS IN FLORIDA—PAST, PRESENT, AND FUTURE[1]

J. F. MORTON
Morton Collectanea, University of Miami
Coral Gables, FL 33124

C. A. SANCHEZ AND G. H. SNYDER
Everglades Research and Education Center
University of Florida, Belle Glade, FL 33430

Additional index words. Eleocharis dulcis, E. tuberosa, waternut, matai, apulid.

Abstract. **The Chinese waterchestnut (*Eleocharis dulcis* (Burm. f.) Trin. ex Henschel), is represented by two forms, the wild, with small, hard corms which abounds in fresh, brackish and saline waters of southern Asia and much of Oceania (eaten directly and made into starch), and the cultivated, large, sweeter, juicier corm developed in China and widely cultivated commercially. The improved cultivar was introduced into the United States in 1934 and grown mainly for research purposes at the USDA Barbour Lathrop Plant Introduction Garden, Savannah, Georgia; commercially by James Banks at Orlando, Florida; for education and distribution by Professor G. W. Groff at Laurel, Florida; and, since 1960, for research and development, at the Richard B. Russell Agricultural Research Center, Athens, Georgia. In recent years, the demand for waterchestnuts has increased in the United States. As part of a program exploring the prospects of growing aquatic vegetables in areas of the Everglades subject to critical soil subsidence, the University of Florida's Everglades Research and Education Center at Belle Glade began tank culture of waterchestnut in 1975. Results have been favorable and field trials are under way with a view to assisting expansion of waterchestnut production in Florida. Cultural and nutritional studies are being conducted as well as salinity tests, and investigations of the potential utility of the waterchestnut for waste water treatment.**

The Chinese waterchestnut *Eleocharis dulcis* (Burm. f.) Trin. ex Henschel (syns. *E. tuberosa* Schult.; *Scirpus tuberosus* Roxb.; *Heleocharis plantaginea* R. Br.; *Andropogon dulce* Burm. f.), is so-called to distinguish it from the aggressively weedy *Trapa natans* L. (family Trapaceae) which has been widely known as waterchestnut for a longer time. Other names for *Eleocharis dulcis* include waternut, matai (in China), *ma thay* (in Vietnam), *apulid* (in the Philippines), *chikai*, *dekeng* or *tekee* (in Indonesia) and a number of dialectal appellations. The United States Department of Agriculture at one time proposed that the name waternut be chosen for *Eleocharis dulcis* but it was viewed as not being sufficiently different from waterchestnut. The Chinese matai was then suggested, but not generally adopted (26).

Description

The Chinese waterchestnut is the 4- to 6-ringed, oblate, crisp, white-fleshed, juicy, sweetish, starchy corm (2.5 to 5 cm wide) developing, at a depth of 15 to 25 cm, at the tips of slender, late-appearing rhizomes radiating and descending from the base of a dense tuft of slim, tubular, green, ringed leaves to 2 m high, which are hollow except for membranous partitions spaced at intervals (Fig. 1, 2, and 3)). The leaves are usually pale at the base with dry, brown sheaths. In the wild form, 'Sui matai', (cultivated only in China and perhaps Japan), the leaves are 1 to 10 mm broad and the corm small, black-skinned and relatively hard and dry. Minute flowers are massed in spikes 2 to 3 cm long at the tips of the leaves. The plant spreads by early, horizontal rhizomes which do not bear corms (2, 5, 13, 21).

Origin and Distribution

This sedge is native to eastern Asia and of ancient cultivation in ponds or tanks (25) in eastern and southeastern China, Taiwan and Hong Kong, and throughout former Indo-China. Quantities have long been exported to Calcutta and Singapore (6). The plant grows wild especially in the Yangtze valley of China (25); also in Indonesia in fresh-

[1]Florida Agricultural Experiment Stations Journal Series No. 9640.