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Cultural Guidelines for Commercial Production of Interiorscape *Ficus*¹

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The genus *Ficus*, (Latin for fig), is a member of the family Moraceae and contains over 800 species. Figs are woody trees, shrubs, or vines native to Asia, Australia, and Africa. Cultivated species either produce edible fruit or possess ornamental value. This article describes common species and cultivars in the foliage plant industry (see Table 2), provides guidelines for their culture and interior use, and lists physiological problems that may be encountered during production and interiorscape use (see Table 3).

Cultural Guidelines

1. Propagation

Rooting of cuttings, air layering, and tissue culture are primary methods of fig propagation. Air layering or cuttings are mainly used for large specimens, whereas tissue culture propagated liners are used for producing figs in 10-inch or smaller containers. Due to the difficulty in rooting and tissue culture, *F. binnendijkii* 'Amstel King' is still propagated by air layering.

2. Production

Sphagnum peat, pine bark, vermiculate, or perlite can be volumetrically combined to formulate media for *Ficus* production. *Ficus* requires media with good container capacity and aeration, pH of 5.5-7, and soluble salts of 1-2 dS/m. Media may contain 10-20% coarse sand to keep plants from wind tipping. Excessive root growth beneath the containers should be trimmed regularly. Cease trimming roots one month before shipment because damage to roots at that time will shock the plant and affect interior performance.

Ficus should be grown in a shadehouse with a temperature of 70 to 95°F and a relative humidity of 60 to 100%. Either controlled-released or water-soluble fertilizers with micronutrients, or a combination of both can be used for *Ficus* production. The appropriate ratio of N:P:K should be 3:1:2 or 3:1:3. The suggested application rate is 3 lbs N per 1,000 sq ft per month. Table 2 provides a guide for determining whether figs are appropriately fertilized based on leaf analysis. It is advisable to stop fertilizing one month before shipment. *Ficus* require plenty of water. Irrigate frequently during hot weather.

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Table 1. Nutrient concentrations in leaves considered low, medium, or high for *Ficus* growth.

Nutrient	Low	Medium	High
Nitrogen (%)	<1.5	1.5-3.5	>3.5
Phosphorus (%)	<0.1	0.1-0.5	>0.5
Potassium (%)	<1.0	1.0-3.0	>3.0
Calcium (%)	<0.8	0.8-2.5	>2.5
Magnesium (%)	<0.2	0.2-1.0	>1.0
Sulfur (%)	<0.1	0.1-0.5	>0.5
Iron (ppm)	<40	40-200	>200
Manganese (ppm)	<20	20-200	>200
Zinc (ppm)	<10	10-200	>200
Copper (ppm)	<5	5-25	>25
Boron (ppm)	<20	20-50	>50

Ficus can grow at light levels varying from deep shade to full sun. However, *Ficus* is sensitive to radical changes in light intensities, particularly from production shadehouse to interior low light conditions. To produce superior interiorscapeable trees, two common procedures have been used in plant production. One is to initially grow them under 50% shade (about 6,250 foot candles), and then acclimatize them under 80-90% shade (about 2,500 to 1,250 foot candles) for at least two months before using them for interiorscaping. The other is to initially grow them under 70-80% shade (3,750 to 2,500 foot candles) until they are ready for interior use.

Results from our recent studies may assist with the choice of light levels for *Ficus* production. Nine cultivars: 'Florida Spire', 'Indigo', 'Midnight', 'Midnight Princess', 'Monique', and 'Winter Green' of *Ficus benjamina*, 'Cabernet' and 'Melany' of *F. elastica*, and 'Alii' of *F. binnendijkii* were grown to marketable size from cuttings or tissue cultured

liners. The cultivars were grown under three different light conditions: 50, 70, or 80% shade (6,250, 3,750, or 2,500 foot candles). We then evaluated them for indoor performance in conditioning rooms with low light levels of 50 and 100 foot candles for one year. Data showed that plants produced under 70-80% shade were not only significantly larger and had better leaf color but also performed better under interior light levels of 100 or 50 foot candles than plants produced under 50% shade.

Shipping and Interior Care

Ficus should be shipped at a temperature of 55-65°F. Once plants are placed indoors, it is advisable not to move, prune, re-pot, or fertilize them for about four weeks at least because plants do not need additional stresses. However, only those plants produced continuously under light levels 70% or lower or produced under relatively high light levels but acclimatized under 80% shade for at least two months are suitable for interior use under light levels of 100 to 200 foot candles. 'Alii' may be used under 50 foot candles. Plants should not be fertilized if soluble salts are 1.0 dS/m or more when solution is extracted by the pour-through method. If soluble salt levels are higher than 3.0 dS/m, leaching the media may help reduce potential leaf burning problems. Media should be kept moist. Temperatures of 65 to 80°F are most appropriate, and drafts should be avoided. Proper pruning is usually necessary to maintain shape, thin foliage for better light penetration, and remove dead branches.

Table 2. A listing of cultivars by species available in Florida as of 2002.

Species	Cultivar	Characteristics
<i>F. benjamina</i>	'Florida Spire', 'Indigo', 'Jacqueline', 'Midnight', 'Monique', 'Natasja', 'Spearmint', 'Stacey', 'Starlight', 'Too Little', 'Variegata', 'Wiandi', 'Window Pane', 'Wintergreen'	The most abundant. A small shrub or tree with adventitious roots and glossy leaves. Tolerance to and conditioning for interior light levels varies from cultivar to cultivar.
<i>F. binnendijkii</i> Perhaps <i>F. binnendykii</i>	'Alii' or 'Sabre', 'Amstel King'	A shrub or tree with long, saber-shaped leaves that are red when they first emerge.
<i>F. elastica</i>	'Burgundy', 'Cabernet', 'Decora', 'Robusta', 'Sylvie'	A sparse shrub or tree with large, waxy, dark purplish-green leaves.
<i>F. lyrata</i>	'Fiddle-Leaf', 'Compacta', 'Everglades', 'Suncoast Compacta'	A large shrub or tree with large, coriaceous leaves that resemble the body of a fiddle.
<i>F. microcarpa</i> Formerly <i>F. nitida</i>	'Hawaii', 'Kay', 'Nitida'	Tree forms used outdoors in tropical regions but commonly used as a bonsai indoors.
<i>F. pumila</i>	'Creeping Fig', 'Snowflake'	A vine that is often used in cooler interiorscape locations.
<i>F. retusa</i>	'Kingman'	Thick trunk. Popular as bonsai.
<i>F. rubiginosa</i>	'Rusty Fig'	Low spreading shrub with rust-red coloring on leaf undersurfaces.
<i>F. salicifolia</i> Formerly <i>F. neriifolia</i>	'Willow-Leaf Fig'	Resembles a willow tree and is very popular with bonsai artists.

Table 3. Causes and effects of various physiological problems.

Symptoms	Probable Cause	Treatment
Loss of lower leaves only	Age	Prune to shape.
Yellowing of leaf edges	Underfeeding	Increase fertilizer rate or application frequency.
Dry and shriveled leaves	Low relative humidity or too much sunlight	Increase relative humidity or remove from bright area.
Twig dieback	<i>Phomopsis</i> , a fungus brought about by water stress	Remove dead twigs with sterilized shears, spray affected plant part with a thiophanate methyl fungicide, and avoid water stress.
Yellow leaf drop, small red spots on the undersides of leaves, bent branches	Moisture stress	Adjust watering.
Green leaf drop	Ethylene exposure- Root death	Malfunctioning space heaters. Clean and adjust heaters. Media may be excessively wet. Allow to dry prior to re-watering.

Table 3. Causes and effects of various physiological problems.

Green leaf drop	Low light stress	Move plant to a brighter area.
Green leaf drop	Mercury (Hg) exposure, usually due to a newly painted area	Remove plant from area.
Excess leaf drop, leaves are pale green, leaves are V-shaped, branches are stiff with narrow angles	Plant was produced under high light intensity	Place plant in higher light area and gradually acclimate to lower light levels.
Loss of oldest leaves, stunted growth, new growth is darker then turns yellow, shriveled roots	High soluble salts	Reduce fertilization, use water with low soluble salt levels and leach soil.
Necrosis or chlorosis of the old leaf margins	Potassium deficiency (K)	Add potassium chloride or potassium nitrate to the soil at recommended rate.
Interveinal chlorosis in terminal leaves, especially in <i>F. nitida</i>	Manganese deficiency (Mn)	Use a micronutrient fertilizer, spray with manganese sulfate at a rate of 0.5 lbs/100 gallons.
Chlorosis on youngest leaves	Magnesium deficiency (Mg) This is unusual in <i>Ficus</i> since Mg deficiency usually occurs in old leaves	Spray or drench with magnesium sulfate, chelated magnesium, or magnesium nitrate at recommended rate.
Decrease in leaf area	Boron deficiency (B)	Drench or spray with borox.
Extreme chlorosis or necrosis of the youngest leaves	Boron toxicity (B)	Leach soil, remove and stop using any rat or ant pesticides containing boron in the area.
Tip burn in older leaves	Sodium toxicity (Na)	Leach soil, supplement with potassium and gypsum.
Slimy, necrotic spots on leaves, mass leaf drop	Chilling injury	Plants should be kept in areas above 60° F at all times, including shipping and showcasing.