

# FOLIAGE

## Introduction

Florida leads the nation in foliage plant production, accounting for more than 55 percent of national wholesale value every year since the 1960s. The UF/IFAS foliage plant breeding program at the Mid-Florida Research and Education Center in Apopka is the only organized foliage crop breeding effort in the world and is of significant importance to Florida's nursery industry and consumers. The program's worldwide economic impact last year was at least \$10 million.

## From the Beginning

The foliage plant breeding program was established in 1976 to create new ornamental tropical foliage plant cultivars. Potential breeding material was collected internationally. Initial breeding research was divided into four stages.

In stage one, factors affecting flowering were addressed. Techniques to induce flowering and produce seed with different species of foliage plants had not previously been developed, and no data or publications existed. The primary barrier to breeding ornamental aroids—the common name given to members of the Araceae plant family, one of the dominant families in the foliage plant industry—was the inability to induce simultaneous flowering of different species. UF/IFAS plant breeders discovered that gibberellic acid ( $GA_3$ ) sprays stimulate flowering, overcoming this barrier for *Aglaonema*, *Dieffenbachia*, and *Spathiphyllum*.  $GA_3$  sprays also allowed growers to produce flowering *Spathiphyllum* on demand year-round, making this foliage plant one of the world's most valuable flowering crops today.

Stage two defined environmental requirements for seed production. While *Anthurium* and *Spathiphyllum* produce bisexual flowers and have showy spathes that add to their ornamental value, neither genus required special environmental manipulation to aid in seed set. However, to obtain seed from *Aglaonema* and *Dieffenbachia* flowers, 100 percent relative humidity is required for pollen germination. UF/IFAS plant breeders pioneered a technique of wrapping a newly pollinated spadix with moistened paper towel and placing it in a plastic bag for 24 hours. With this technique, large populations could be established from seed and evaluated for commercial application.

In stage three, with reliable methods in place for controlling flowering and for seed production, the genetics of ornamental traits could be analyzed. Genetic analysis showed that a single

dominant gene with multiple alleles determined variegation patterns within *Dieffenbachia* and *Aglaonema*. The presence of leaf variegation was dominant over nonvariegation. Multiple genes controlled basal shoot formation in both genera. Genetics showed that plant variegation was carried on chromosomes, could be transmitted via the male or the female parent, and was not due to virus, as was believed previously for aroids. Different patterns could be combined in hybrids through selection, allowing university and private breeders to direct crosses and select for favorable traits.

In addition to new types of leaf or foliage color, shape, and leaf orientation on the plant, increased plant vigor, full appearance, tolerance to low light levels, flower production, increased flower counts, earlier flower development, and disease resistance are attainable goals.

To ensure success of UF/IFAS hybrids released from the program, the fourth stage—then and now—involves thorough testing of hybrids under simulated commercial and consumer conditions.

## Today and Tomorrow

New lab techniques allow UF/IFAS researchers to determine hybrid characteristics without having to grow plants to full size. This can reduce research time by two or more years.  $GA_3$  and other growth regulators are being applied to selected plant genera, including *Epipremnum*, *Philodendron*, and *Zamioculcas*, to induce flowering on demand. A comprehensive plant tissue culture program has led to methodologies that will allow creation of novel plant forms and increase the potential for new cultivar development.



## Foliage Varieties Released from 2002

Release Date	Cultivar
<b>Aglaonema</b>	
11/1/2002	'Moonlight Bay'
6/4/2008	Mondo Bay® 'UF-742-3' (USPP20,463)
11/13/2008	Key Lime 'UF25712KL' (USPP19,712)
11/13/2008	Leprechaun 'UFSB2' (USPP19,714)
1/5/2010	Scenic Bay 'UF-808-4' (USPP22,825)
<b>Anthurium</b>	
8/27/2002	'Athena'
8/27/2002	'Bronze Beauty'
<b>Dieffenbachia</b>	
7/1/2002	'Sterling' (USPP14,762)
7/1/2002	'Tropic Honey'
10/15/2002	'GoldRush'
<b>Philodendron</b>	
11/12/2008	Frippy Philly™ 'UFM1' (USPP20,916)
<b>Pothos</b>	
11/12/2008	Green Genie 'UFM10' (USPP20,930)
11/12/2008	Pearls and Jade® 'UFM12' (USPP21,217)

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