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NEPHTHYTIS CULTIVARS TO KNOW AND GROW

R. W. HENLEY AND C. A. ROBINSON¹
Central Florida Research and Education Center
IFAS, University of Florida
Apopka, FL 32703

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Abstract. Twenty-eight nephthytis (*Syngonium*) species and cultivars from tissue culture in 72-cell trays were potted in 12-cm pots and grown during the winter of 1992 and spring of 1993 in a shaded greenhouse. After 16 weeks, plants were measured for top growth, leaf dimensions and assigned leaf color codes. Plant height ranged from 13-29 cm. The number of plants with specific growth habits were: few shoots (8), intermediate (12), and clump-like (8). Leaf texture designations, based on leaf surface area, were as follows: fine (6), intermediate (15), and coarse (7). The leaf colors and primary vein colors of the 28 cultivars evaluated were recorded.

Nephthytis is the common name used by most people in the foliage plant industry for aroids belonging to the genus - *Syngonium* Schott. The botanical name formerly used for *Syngonium* was *Nephthytis*, hence the common name used today. Many popular plant books refer to nephthytis as arrowhead vines, a name derived from the leaf blade shape.

There are approximately 20 *Syngonium* species which are indigenous to tropical America (Liberty Hyde Bailey Hortorum, 1976). Of the species listed in Hortus Third, only *S. wendlandii* is propagated through tissue culture for the Florida foliage plant industry in its original state. The remaining plants are either hybrids or mutants (sports) of hybrids or species. The literature suggests that many of the currently popular cultivars are selections from *S. podophyllum* or hybrids of the species (Liberty Hyde Bailey Hortorum, 1976).

It was estimated in 1992 that nephthytis composed 2% of the Florida-grown foliage plant mix (Sheehan, 1993). This represents essentially no change in proportion of nephthytis to the total foliage plant product mix on a state-

wide basis since 1975 (Smith and Strain 1976). In 1976 nephthytis was estimated to be 4%, 1%, and 2% of the total foliage plant mix for central Florida, south Florida, and statewide, respectively.

Nephthytis produced by tissue culture laboratories are in a juvenile phase when sold as microcuttings or plugs. Plants in the juvenile phase produce arrowhead-shaped leaves. As most of these plants grow in size, and particularly as they develop long vines under bright light, the new leaves become lobed in a palmate pattern. This leaf shape transition indicates that the plant is mature, or nearly so. Considering the low light levels in most interiorscapes and the restriction of plant size through pruning, nephthytis plants usually remain in the juvenile state when grown indoors.

Nephthytis are sold to retail consumers as specimen plants in small containers up to approximately 20 cm (8-inch) diameter. Very small plants in cell trays or individual containers up to 7.5 cm (3-inch) are frequently used in combination planters, such as dish gardens. One of the most popular uses of the plant is in 15-30 cm (6-12-inch) hanging planters. A few nephthytis are grown in pots fitted with a vertical stake, pole or trellis which supports the vines; those finished on a supporting pole are called totems.

Commercial interiorscapers have extended nephthytis utilization to include large specimens [containers exceeding 20 cm (8-inch)], large hanging planters [containers exceeding 30 cm (12-inch)], and mass planting for ground cover effect by placing plants on 45-75 cm (18-30-inch) centers, depending upon the cultivar. Nephthytis are excellent for plantings which cascade over cabinets, walls and similar construction features.

The purpose of this report is to characterize the growth habits and appearance of the major nephthytis cultivars grown in Florida.

Materials and Methods

Twenty-eight cultivars of *Syngonium* were obtained from four commercial plant tissue culture laboratories as established plants ("plugs") in 72-cell cavity trays filled with a peatlite medium. Since the growth habit of a tissue-cul-

¹Florida Agricultural Experiment Stations Journal Series Number N-00916.

¹Professor and Biological Scientist, respectively.

Table 1. Canopy dimensions, vigor classification, number of shoots, and growth habit of 28 *Syngonium* cultivars grown as potted plants.

Cultivar	Plant height (cm)	Plant width ^z (cm)	Width ratio ^v	Shoots per plant	Habit of growth designation ^u
AD	16.2 e,f,g,h ^w	26.3 j,k	1.1 c,d,e	5.0 g,h,i	I
Bob Allusion	19.0 c,d,e	30.2 f,g,h,i,j	1.1 c,d,e	4.8 g,h,i,j	F
Bold	16.5 e,f,g,h	32.6 d,e,f,g,h	1.1 c,d,e	6.0 e,f,g,h	I
Bold Allusion	16.5 e,f,g,h	27.3 j,k	1.1 c,d,e	4.3 g,h,i,j	F
Cream Allusion	17.8 c,d,e,f	35.6 c,d,e	1.2 b,c,d,e	5.8 e,f,g,h,i	I
Cream Tetra	17.8 c,d,e,f	30.4 e,f,g,h	1.2 b,c,d,e	6.3 d,e,f,g,h	I
Dali	16.5 e,f,g,h	28.3 h,i,j,k	1.3 b,c	2.3 j	F
Degas	19.7 c,d	39.8 b,c	1.2 b,c,d,e	3.2 i,j	F
Flutterby	13.0 i	25.2 k	1.1 c,d,e	9.0 b,c	C
Freckles	17.0 d,e,f,g	30.0 f,g,h,i,j	1.1 c,d,e	5.7 e,f,g,h,i	I
Gold	14.7 g,h,i	25.1 k	1.3 b,c,d,e	4.7 g,h,i,j	F
Gold Allusion	16.2 e,f,g,h	29.8 g,h,i,j	1.2 b,c,d,e	7.0 c,d,e,f,g	I
Goya	20.5 c	41.3 b	1.3 b,c,d	6.3 d,e,f,g,h	I
Holly	16.3 e,f,g,h	28.1 h,i,j,k	1.2 b,c,d,e	6.8 c,d,e,f,g	I
Infra Red	9.3 j	19.0 i	1.2 c,d,e	3.7 h,i,j	F
Lemon Lime	17.2 d,e,f,g	35.6 c,d,e	1.1 c,d,e	9.7 b	C
Monet	16.8 d,e,f,g	34.1 d,e,f,g	1.2 c,d,e	7.7 b,c,d,e,f	C
Pink Allusion	19.0 c,d,e	34.6 e,d,f	1.1 c,d,e	6.3 d,e,f,g,h	I
Pixie	16.3 e,f,g,h	27.6 i,j,k	1.1 c,d,e	7.7 b,c,d,e,f	C
Pride	13.0 i	28.5 h,i,j,k	1.0 e	14.0 a	C
Renoir	23.2 b	33.3 d,e,f,g	1.1 c,d,e	5.7 e,f,g,h,i	I
Robust Allusion	15.5 f,g,h,i	30.2 f,g,h,i,j	1.2 c,d,e	8.3 b,c,d,e	C
Robusta	15.2 f,g,h,i	32.2 e,f,g,h,i	1.1 c,d,e	13.3 a	C
Roxanne	20.2 c	51.0 a	1.4 b	53 f,g,h,i	I
Silver Robusta	20.2 c	37.0 c,d	1.1 d,e	8.8 b,c,d	C
<i>S. wendlandii</i>	28.8 a	35.5 c,d,e	1.1 d,e	4.0 h,i,j	F
White Butterfly	20.0 c	30.4 f,g,h,i,j	1.1 c,d,e	5.8 e,f,g,h,i	I
Willsonii	13.7 h,i	51.6 a	2.1 a	3.2 i,j	F

^wPlant width = widest dimension + dimension 90 degrees to widest dimension / 2.

^vWidth ratio = widest dimension / dimension 90 degrees to widest dimension.

^uHabit of growth: F = few shoots (less than 5 shoots), I = intermediate habit with 5 to 7 shoots, compact and clump-like habit with more than 7 shoots.

^zMean separation in rows by Duncan's multiple range test, 5% level.

Table 2. Leaf dimensions of 28 *Syngonium* cultivars grown as potted plants.

Cultivar	Lamina length (cm)	Lamina width (cm)	Petiole length (cm)	Lamina area (cm ²)	Length/width ratio	Leaf texture designation ^z
AD	8.7 j,i ^v	7.3 g,h,i,j,k,l	11.0 i,j,k	42.7 i,j,k	1.2 g,h,i	I
Bob Allusion	12.2 b,c,d,e,f	10.2 a	13.8 c,d,e,f	91.2 a,b	1.2 f,g,h,i	C
Bold	14.5 a	10.0 a,b	14.5 b,c,d	92.2 A	1.5 c,d,e,f	C
Bob Allusion	10.8 e,f,g,h	9.2 a,b,c,d,e	13.3 c,d,e,f,g	68.3 c,d,e	1.2 h,i	I
Cream Allusion	13.0 a,b,c,d	8.2 c,d,e,f,g,h,i	14.2 b,c,d	68.7 c,d,e	1.6 c,d,e	I
Cream Tetra	11.3 c,d,e,f,g,h	9.7 a,b,c	14.2 b,c,d	76.8 c	1.2 g,h,i	C
Dali	12.7 b,c,d,e	6.8 i,j,k,l,m	7.8 m,n	42.8 i,j,k	1.9 a,b	I
Degas	11.5 c,d,e,f,g	9.0 a,b,c,d,e,f	11.2 h,i,j,k	49.0 g,h,i,j	1.3 e,f,g,h,i	I
Flutterby	8.8 i,j	4.7 n	9.5 k,l,m	23.8 m	2.0 a	F
Freckles	12.2 b,c,d,e,f	7.7 e,f,g,h,i,j,k	12.0 e,f,g,h,i	52.8 f,g,h,i	1.6 c,d,e	I
Gold	11.3 c,d,e,f,g,h	7.0 h,i,j,k,l,m	14.5 b,c,d	57.3 e,f,g,h	1.6 c,d,e	I
Gold Allusion	13.2 a,b,c	8.5 b,c,d,e,f,g,h	15.8 a,b	78.0 b,c	1.6 c,d,e	C
Goya	12.0 b,c,d,e,f	8.2 c,d,e,f,g,h	11.0 i,j,k	70.3 c,d,e	1.5 c,d,e,f,g	C
Holly	12.5 b,c,d,e	9.2 a,b,c,d,e	15.0 b,c	61.2 d,e,f,g	1.5 c,d,e,f,g,h	I
Infra Red	9.7 g,h,i	7.3 g,h,i,j,k,l	9.8 l,k,j	33.2 k,l,m	1.3 e,f,g,h,i	F
Lemon Lime	11.2 d,e,f,g,h	8.0 d,e,f,g,h,i,j	13.2 c,d,e,f,g,h	60.0 d,e,f,g	1.4 e,f,g,h,i	I
Monet	12.0 b,c,d,e,f	8.2 c,d,e,f,g,h	13.0 c,d,e,f,g,h,i	60.7 d,e,f,g	1.5 c,d,e,f	I
Pink Allusion	13.7 a,b	9.3 a,b,c,d	13.5 c,d,e,f,g	78.8 b,c	1.5 c,d,e,f,g	C
Pixie	7.7 j	5.5 m,n	14.5 b,c,d	26.3 l,m	1.4 e,f,g,h,i	F
Pride	9.5 h,i	6.0 m,n	11.8 e,g,h,i,j	32.2 k,l,m	1.6 c,d,e	F
Renoir	11.5 c,d,e,f,g	10.0 a,b	14.0 b,c,d,e	67.0 c,d,e,f	1.2 i	I
Robust Allusion	8.8 i,j	6.2 k,l,m	12.5 d,e,f,g,h,i	36.0 j,k,l,m	1.4 d,e,f,g,h,i	F
Robusta	12.3 b,c,d,e	8.7 a,b,c,d,e,f,g	17.2 a	65.5 c,d,e,f	1.4 d,e,f,g,h,i	I
Roxanne	10.3 f,g,h,i	7.5 f,g,h,i,j,k,l	9.0 l,m,n	44.3 h,i,j,k	1.4 d,e,f,g,h,i	I
Silver Robusta	10.8 e,f,g,h	7.7 e,f,g,h,i,j	13.7 c,d,e,f,g	59.5 d,e,f,g	1.4 d,e,f,g,h,i	I
<i>S. wendlandii</i>	11.3 c,d,e,f,g,h	6.5 j,k,l,m	11.7 g,h,i,j	39.7 i,j,k,l	1.7 a,b,c	F
White Butterfly	12.5 b,c,d,e	9.0 a,b,c,d,e,f	11.2 h,i,j,k	73.5 c,d	1.4 d,e,f,g,h,i	C
Willsonii	13.2 a,b,c	8.0 d,e,f,g,h,i,j	7.2 n	64.5 c,d,e,f	1.7 b,c,d	I

^zLeaf texture based on area: F (fine) = less than 40 cm², I (intermediate) = 40-70 cm², and C (course) = greater than 70 cm².

^vMean separation in rows by Duncan's multiple range test, 5% level.

tured plants differs initially from conventional cutting-grown plants, it was decided to use only laboratory-produced plants for this evaluation. The plugs were transplanted to 12-cm (4.8-inch) pots using Verlite Nursery Mix A (without superphosphate) on 4 Dec 1993. Plants were grown in a shaded greenhouse with 1200-1500 foot-candles at mid-day and maintained within a temperature range of 18°C (65°F) and 32°C (90°F). On 2 April 1993,

measurements of plant height above the potting medium, width of canopy at widest point plus the width of canopy 90 degrees to the widest point divided by 2, and number of shoots per pot were recorded.

On 4 May 1993, five recently expanded leaves were collected and measured from each cultivar. Measurement of the leaves included: lamina (leaf blade) length, lamina width, and petiole length. Leaf color data was collected 13

Table 3. Leaf color data for 28 *Syngonium* cultivars grown as potted plants.

Cultivar	Upper surface color(s) ^{xy}	Lower surface color(s)	Midrib color	Secondary vein color	Margin color(s)	Leaf color designation(s)
AD	YGn-145-D + Gn-137-D	YGN-146-D	RPu-65-A W-155-D	W-155-D	N.A.	Gn + Gy-Gn; R-veined
Bob Allusion	YGn-147-C	YGN-147-B	R-55-A + W-155-C	R-55A + W-155-C	YGn-147-A (flecks)	Gn + OGn; R-veined
Bold	GyGn-193-B	YGn-147-B	N.A. *	N.A.	Gn-137-A	Gn + GyGn; S-Y-veined
Bold Allusion	Gn-139-A GyGn-193-B R-65-B	YGn-147-B	RPu-65-A	RPu-65A	RPu-65-A	OGn + GyGn; R-veined
Cream Allusion	YGn-146-B	Gn-138-B	RPu-66-B + W-155-D	RPu-66- B + W-155-D	RPu-66-B + Gn-138B	OGn; R-veined
Cream Tetra	YGn-147-D + Gn-137-C	Gn-137-C	GyGn-192-D	GyGn-192-D	Gn-137-C	GyGn-S; S-veined
Dali	YGn-147-B + GyR-178-A	YGn-147-B	YGn-147-B	YGn-147-B	YGn-147-B	B; Gn-veined
Degas	Gn-137-A	Gn-138-B	RPu-65-D + GyGn- 196-D + R-36-C	RPu-65-D + GyGn-196-D + R-36-C	N.A.	Gn + R- centered; R-veined
Flutterby	Gn-139-B + GyGn-196-B + YGn-157-B	Gn-139-B	YGn-157-B + GyGn-196-B	YGn-157-B + GyGn-196-B	N.A.	Gn + GyGn; S-Y-veined
Freckles	YGn-146-A + YGn-145-D + YGn-142-B	YGn-147-B	YGn-145-D	YGn-145-D	YGn-145-D	Gn + YGn; Y- veined
Gold	YGn-145-B + YGn-151-A	YGn-145-B + YGn-151-A	YGn-151-A + GyGn-196-C	YGn-151-A + GyGn-196-C	YGn-151-C + GyGn-196-C	YGn; S-veined
Gold Allusion	YGn-145-A + YGn-145-C	Gn-134-B	W-155 D + R-51-C	W-155-D + R-51-C	N.A.	YGn; R-veined
Goya	Gn-137-A	YGn-146-B or YGn-147-B	YGn-150-D	YGn-150-D	N.A.	Gn; Y-S-veined
Holly	Gy W-157-B + Gn-137-C	Gn-137-C	GyGn-196-D + Gy W-157-B	GyGn-196-D + GyW-157-B	Gn-137-C	S; S-veined
Infra Red	GN-137-D + RPu-64-D	Gn-137-B	RPu-64-D	RPu-64-D	N.A.	R; R-veined
Lemon Lime	YGn-147-A + YGn-157-A + W-155-C	YGn-147-A	GyGn-196-D + GYW-156-A	GyGn-196-D + GyW-157-A	GyGn-196- D + GyW-156-A	Gn + GyGn; Y-S-veined
Monet	Gn-137-A	Gn-137-C	W-155-C + RPu-59-A	W-155-C	W-155-C	Gn; S-veined
Pink Allusion	Gn-138-B + YGn-144-B + YGn-144-B	Gn-137-B	YGn-144-D + RPu- 66-A	YGn-144-D + RPu-66-A	Gn-138-A	Gn + OGn; R-veined

Table 3. Continued

Cultivar	Upper surface color(s) ^{a,y}	Lower surface color(s)	Midrib color	Secondary vein color	Margin color(s)	Leaf color designation(s)
Pixie	GyY-160-D + Gn-143-A	GyY-160-D + YGn-145-C	GyGn-192-D	GyGn-192-D	Gn-143-A	Gn + GyGn; S-veined
Pride	GnW-157-A	YGn-145-B	Gn-196-D	Gn-196-D	N.A.	GyGn-S; S-veined
Renoir	YGn-146-B + Gn-196-D	YGn-146-B	YGn-146-B	YGn-146-B	YGn-146-B	GyGn-OGn; S-veined
Robust Allusion	Gn-138-A + Gn-138-B	Gn-138-B	Gn-138-A + RPu-66-A + YGn-150-D	Gn-138-A + RPu-66-A + YGn-150-D	YGn-150-D	Gn + OG; R-veined
Robusta	Gn-137-B	YGn-146-D	YGn-145-D + W-155-D	YGn-145-D + W-155-D	YGn-145-D + W-155-D	Gn + GyGn; Y-S-veined
Roxanne	Gn-137-A or Gn-137-B	Gn-137-D	YGn-145-D	YGn-145-D	YGn-145-D	Gn; Y-S-veined
Silver Robusta	YGn-148-D + GyGn-193-B + Gn-138-B	Gn-138-B	GyGn-192-D	GyGn-192-D	YGn-148-D + GyGn-193-B + Gn-138-B	Gn + Gy-Gn; S-Y-veined
<i>S. wendlandii</i>	Gn-139-A	Gn-139-A	GyGn-194-B	GyGn-194-B	N.A.	Gn; S-veined
White Butterfly	Gn-138-A + YGn-151-D	Gn-138-A	GyGn-196-D or YGn-157-B	GyGn-196-D or YGn-151-B	YGn-151-D	Gn + GyGn; Y-S-veined
Wilsonii	GyGn-189-A or Gn-137-A or YGn-147-A + GyW-156-A	GyGn-189-A	GyW-156-B	Few are GW-156-B	W-156-A	Gn; S-veined

^aRHS color group and code number.

^yColor code for dominant color(s) of lumina and primary veins: B = bronze, Gn = green, Gy = gray, O = olive, Pi = pink, R = red, S = silver, W = white, Y = yellow.

*NA indicates color is same as upper surface color.

August 1993 from the same crop which had been transplanted to 15-cm (6-inch) pots on 1 July 1993. A simplified classification of *Syngonium* cultivars was made on the basis of the dominant foliage color or colors. On 25 August leaf surface area was measured with a Li-Cor Area Meter, Model 3100 (Li-Cor, Lincoln, NB).

Results and Discussion

Plant growth habit and vigor are important considerations to nurserymen and consumers alike. Classification of cultivars based on degree of basal branching is displayed in Table 1. The eight cultivars designated as having a growth that produced few basal shoots, less than five, and the shoots which developed frequently had long internodes. Twelve cultivars had intermediate growth habits and eight cultivars had distinct clump habits, forming seven or more shoots per plant, usually with short internodes.

Based on the leaf dimension measurements, six plants were designated as having fine (small) leaves, with a surface area of less than 40 cm², 15 had intermediate size leaves (medium), and seven had course (large) leaves, with a surface area greater than 70 cm² (Table 2). Some of the large-leaved cultivars with clump forming habits resembled the appearance of some fancy-leaved caladiums.

Leaf color and color pattern are among the most important plant attributes that influence consumer plant purchases (Table 3). The first five columns provide specific leaf color(s) of upper surface, lower surface, midrib, secondary veins and margin utilizing the R.H.S. Colour Chart (Anonymous, N.D.,) for color codes used in the table. In the sixth column, leaf color designation was used to represent, with simple nomenclature code, the predominant leaf color(s) and the primary vein color of each cultivar. This descriptive information should be of assistance to plant buyers in all segments of the industry from propagator to the consumer.

Summary

The purpose of this nephthytis cultivar evaluation was to provide descriptive information on most of the cultivars currently available from plant tissue culture laboratories. The measurements expressed in Tables 1-3 should help growers, retail store buyers, interiorscapers, and consumers recognize the diversity which exists among the commercial nephthytis cultivars and help them choose those cultivars with characteristics which most closely match their needs. It is evident at this time that a number of the cul-

tivars reported in this paper are similar and there will probably be some elimination due to production and market demands. Producers also eliminate from culture those cultivars which are not readily salable or have a very slow growth rate. There is a need for some *Syngonium* cultivar performance research under interior light levels to establish their utility indoors over a period of 6 months or more. Some of the cultivars which are slow in production may prove to be superior indoors.

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