

Hawaii Cooperative Extension Service

HORTICULTURE

HITAHR · College of Tropical Agriculture and Human Resources
U. S. Department of Agriculture Cooperating



DIGEST

Department of Horticulture
University of Hawaii at Manoa

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No. 91, March 1990

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The description of *Dendrobium* Sylvia Yuen is given below:

Scape length (in)	5.4 ± 0.7
Spray length (in)	15.7 ± 3.0
No. of flowers per spray	12.2 ± 4.7
Natural spread of flowers—height (in)	1.8 ± 0.2
Natural spread of flowers—width (in)	1.7 ± 0.2
Pedicel length (in)	1.2 ± 0.1
Petal length (in)	1.4 ± 0.2
Petal twist (no. of turns/petal)	0.8 ± 0.2
Percent bud drop	7.3
Leaf length (in)	6.2 ± 0.7
Leaf width (in)	1.3 ± 0.2
Plant height in March '89 (in)	18.3 ± 4.4

DENDROBIUM SYLVIA YUEN

A seedling flask of a cross between *Dendrobium* Plum Jade and *D. antennatum* was received from Dr. Uthai Charanasri of Bangkok Flowers Centre, Inc. in October 1982. Seedlings were compotted immediately, repotted into 2-inch clay pots in June 1983, and moved into 5-inch plastic pots in December 1983. Seedlings began to flower in late 1984 and early 1985.

Plants in their second year of flowering produced numerous flowers on several pseudobulbs (Fig. 1). Flowers on plants brought into air-conditioned offices in Gilmore Hall and St. John Plant Science Laboratory on the Manoa campus remained in excellent condition for as long as three months. The attractive but relatively small flowers are about two inches in length with upright petals twisted about 360 degrees. Petals and sepals are chartreuse toward the tip, white toward the base. The labellum is light yellow striped with purple. We named this hybrid *Dendrobium* Sylvia Yuen in honor of the Associate Dean of the College of Tropical Agriculture and Human Resources.

The pedigree of *D. Sylvia Yuen* is shown in Figure 2. *D. Sylvia Yuen* is a triploid progeny from a cross between amphidiploid Plum Jade having two C (*Ceratobium*) and two E (*Eleutheroglossum*) genomes and diploid *D. antennatum* with two C genomes. Plum Jade resulted from crossing triploid Spiral Gem (CCE) with diploid *D. canaliculatum* (EE), while triploid Spiral Gem is an offspring of tetraploid Salak (CCCC) and diploid *D. canaliculatum* (EE). It is interesting to note that the maternal parents beginning with diploid *D. undulatum* alternated from tetraploid Salak to triploid Spiral Gem to tetraploid Plum Jade to produce triploid Sylvia Yuen. Sylvia Yuen represents the fourth generation of breeding.

We remade *D. Sylvia Yuen* in October 1985 by crossing Plum Jade with *D. antennatum* 'K741-13.' Seeds were germinated on January 30, 1986, transflasked on May 13, 1986, compotted on August 14, 1986, planted in 2-inch clay pots on December 11, 1986, and repotted in 5-inch shallow plastic pots on June 16, 1987. Seedlings began to flower in February 1988 (Fig. 3), only 25 months from the date of germina-

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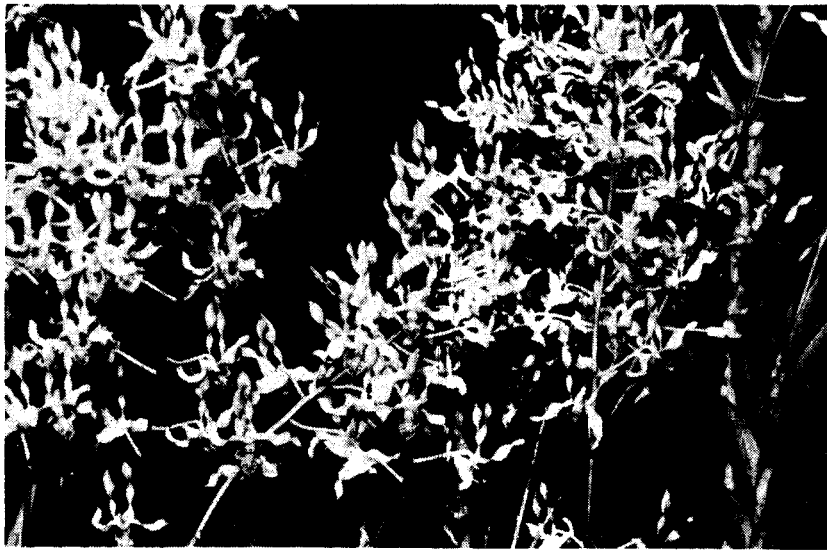


Fig. 1. *Dendrobium* Sylvia Yuen

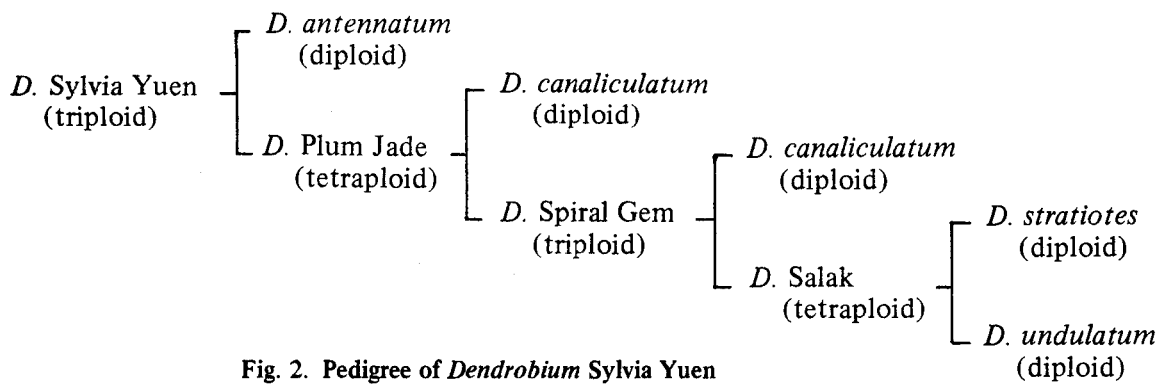


Fig. 2. Pedigree of *Dendrobium* Sylvia Yuen



Fig. 3. A precocious seedling of *Dendrobium* Sylvia Yuen flowering 25 months after germination.

Table 1. Monthly spray yield and saleable plants of *Dendrobium Sylvia Yuen* (UH1101) in 1988-89 based on 23 plants.

Month	No. Sprays	No. Saleable Plants*
JAN 88	0	0
FEB 88	1	0
MAR 88	9	2
APR 88	7	1
MAY 88	2	1
JUN 88	1	0
JUL 88	5	0
AUG 88	3	0
SEP 88	4	1
OCT 88	14	2
NOV 88	17	6
DEC 88	23	7
JAN 89	16	5
FEB 89	26	6
MAR 89	33	8
TOTAL	161	39

*Saleable plants are those with at least two sprays per plant per month. The total number of saleable plants exceeds 23 because several plants were saleable during more than one month.

Table 2. Monthly spray yield and saleable plants of *Dendrobium Sylvia Yuen* (UH1101 B) in 1988-89 based on 32 plants.

Month	No. Sprays	No. Saleable Plants*
APR 88	0	0
MAY 88	1	0
JUN 88	1	0
JUL 88	7	1
AUG 88	4	1
SEP 88	5	0
OCT 88	1	0
NOV 88	7	1
DEC 88	16	4
JAN 89	42	8
FEB 89	49	14
MAR 89	44	14
TOTAL	177	43

*Saleable plants are those with at least two sprays per plant per month. The total number of saleable plants exceeds 32 because several plants were saleable during more than one month.

tion (Table 1). Flowering increased from October 1988 to March 30, 1989, at which time evaluation was terminated.

A second progeny (UH1101B) was obtained by crossing the same parents on March 28, 1986. Seeds were germinated on June 12, 1986 and seedlings were compotted on December 22, 1986, moved into 2-inch pots on April 16, 1987, and into 5-inch plastic pots on September 8, 1987. Several seedlings flowered in July 1988, slightly over two years after germination which is remarkable (Table 2.). By March 1989, slightly under three years from the date of germination, the majority of plants had produced saleable plants with at least two flower sprays in a given month.

Precocious flowering, attractive long lasting flowers, and relatively short stature are attributes of *D. Sylvia Yuen* as a flowering potted plant cultivar.

H. Kamemoto, Teresita D. Amore,
and Nellie C. Sugii

COMING EVENTS

Ornamental Short Course

Planning for the 13th Annual Ornamental Short Course at the Ala Moana Hotel in Honolulu on March 20-21, 1990 is underway. The morning program on Tuesday will focus on new and re-discovered plants for Hawaii's markets, featuring Dr. Richard Henley from the Apopka Research Station in Florida. The afternoon concurrent sessions will be divided into programs for foliage/potted plants and landscape/nursery plants. An industry tour is scheduled for Wednesday and will include the UH Greenhouse, the Halawa Xeriscape Garden and Amfac Nursery. Contact: Fred D. Rauch, 948-7256, for information.

Xeriscape Symposium

An Outdoor Water Conservation and Xeriscape Symposium sponsored by the Board of Water Supply will be held at the Pacific Beach Hotel in Honolulu, March 22, 1990. For more information contact Ernest Lau at (808) 527-5121.

Flower Conference

The Cut Flower Industry Conference will be held March 29-31, 1990 at the Hilo Hawaiian Hotel in Hilo. This will include a two-day program, with emphasis on marketing, promotion and industry cooperation, followed by an all-day industry tour. Funding has been obtained for GACC to bring in overseas speakers. For further

information contact: Kenneth Leonhardt, 3190 Maile Way, Honolulu, HI 96822. (808) 948-8909.

Plant Show

The Annual Hawaii Association of Nurserymen (HAN) Plant Show and Sale is scheduled for the Neal Blaisdell Center in Honolulu on March 30 to April 1, 1990. A number of educational displays and seminars for the general public will be featured.

Mid-Term Turf Conference

The Hawaii Turfgrass Association will hold their Mid-Term Turf Conference at the Royal Waioloa Hotel in Kona on May 24-25, 1990.

Palm Society

The International Palm Society Biennial Meeting will be held in Hilo, Hawaii, June 18 to 20, 1990. Various tours are planned and an educational program to include horticultural information on palms and heliconias (joint presentation with Heliconia Society). Post conference tours are planned for the neighbor islands and Singapore. Contact Trudi Zelko, Hawaii 2000, 2810 Manoa Road, Honolulu, HI 96822 (808) 988-4554 for information.

Landscape Maintenance Workshop

Tentative plans are underway to hold a one-day Landscape Maintenance Workshop on each major island in June or July, 1990. The focus will be on field diagnosis of plant problems and available portable equipment.

Florists' Short Course

The Ohio Florists' Association Annual Short Course and Trade Show will be held on July 8-10, 1990.

Annual Turf Conference

Tentative plans are to hold the HTA Annual Conference at the Sheraton Makaha Hotel in late September.

Interiorscape

The Interior Plantscape Division of the Associated Landscape Contractors of America will hold their Annual Conference and Trade Show on October 10 to 13, 1990 at the Boston Park Plaza, Boston, MA.

HAN Conference

The Hawaii Association of Nurserymen Annual Conference and Mid-Pacific Horticulture Show

is tentatively scheduled for Hilo, Hawaii on October 15 to 17, 1990. For further information contact: HAN, P. O. Box 293, Honolulu, HI 96819 (808)833-3369.

AmeriFlora '92

AmeriFlora '92 will be the first sanctioned International Floral and Garden Expo to be held in the United States. It will run from April 20 to October 12, 1992 in Columbus, Ohio. Featured will be floral and garden products from many countries and many major international horticultural societies are planning to set up displays. Contact AmeriFlora '92, 941 Chatham Lane, Suite 300, Columbus, Ohio 43221, for information.

ASHS Annual Meeting

The American Society for Horticultural Science (ASHS) will hold their 89th annual meeting at the Sheraton Waikiki Hotel and Sheraton Princess Kaiulani Hotel, Honolulu, Hawaii on July 31 to August 8, 1992. The meeting will be hosted by horticulture faculty at the University of Hawaii and include local industry tours.

**DENDROBIUM SUSAN TAKAHASHI,
UH999—A SEED PROPAGATED FLOWERING
POTTED PLANT CULTIVAR**

A cross between a tetraploid *Dendrobium* Evelyn Nakasato and an amphidiploid *D. Jaquelyn Thomas* was made in May, 1981 with the objective of developing a winter flowering, seed-propagated, cut flower cultivar. The offspring flowered throughout most of the year. However, the yield was not as high as the Jaquelyn Thomas type cultivars released earlier by the University of Hawaii, and the bud drop percentage was relatively high. The purple flowers (Red-Purple RHSCC72A) of this cross were slightly larger than those of UH503 and UH507. Also the relatively short stature and year-round flowering were considered desirable features as flowering potted plants.

The cross was repeated in August, 1984 (K999) and again in February, 1985 (K1071) to evaluate the offspring as flowering potted plants. The monthly spray yields for both crosses are shown in Tables 1 and 2 and in Figure 1. Flowering was obtained throughout the year for both years of evaluation. Plants with at least two sprays in any given month were obtained for most of the individual offspring.

Table 1. Monthly and annual spray yield and number of saleable plants* of *Dendrobium* Susan Takahashi, K999 (based on 24 plants).

Month	1987-88		1988-89	
	No. Sprays	No. Saleable Plants	No. Sprays	No. Saleable Plants
SEP	9	2	9	3
OCT	4	0	8	2
NOV	11	4	6	1
DEC	0	0	7	0
JAN	14	5	4	1
FEB	5	0	11	3
MAR	5	2	9	2
APR	3	1	12	3
MAY	7	1	7	1
JUN	6	1	21	7
JUL	15	3	27	9
AUG	16	6	26	10
TOTAL	95	25	147	42

* Saleable plants are those with at least two sprays per plant. The total number of saleable plants exceeds 24 because plants were saleable during more than one month.

Table 2. Monthly and annual spray yield and number of saleable plants* of *Dendrobium* Susan Takahashi, K1071 (based on 24 plants).

Month	1987-88		1988-89	
	No. Sprays	No. Saleable Plants	No. Sprays	No. Saleable Plants
SEP	1	0	7	1
OCT	9	1	12	3
NOV	8	0	5	1
DEC	2	1	5	1
JAN	1	0	1	0
FEB	10	3	3	1
MAR	6	1	7	2
APR	6	2	4	1
MAY	4	1	5	1
JUN	10	2	12	3
JUL	6	2	14	4
AUG	10	3	24	10
TOTAL	73	16	99	28

* Saleable plants are those with at least two sprays per plant. The total number of saleable plants exceeds 24 because plants were saleable during more than one month.

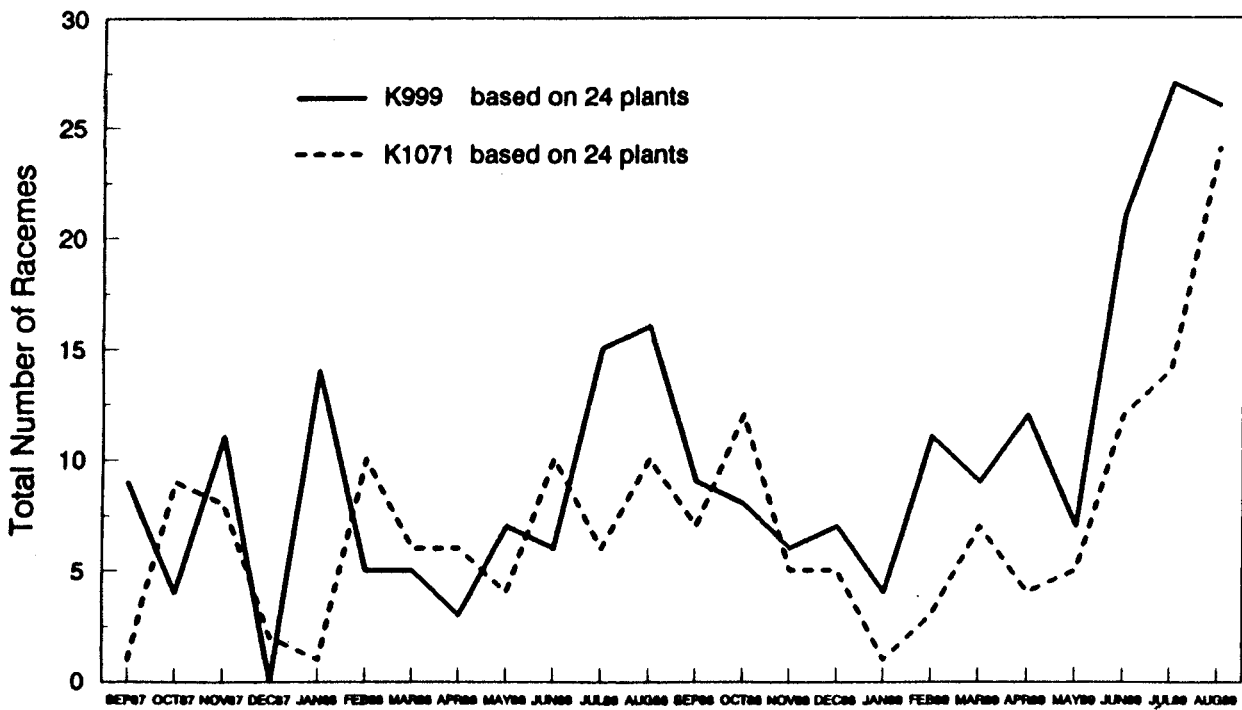


Fig. 1. Monthly spray yields of *Dendrobium* Susan Takahashi, K999 and K1071.



Fig. 2. *Dendrobium* Susan Takahashi and its namesake.

The characteristics of UH999 (=K999, K1071) are as follows:

Natural spread of flowers—height (in.)	2.4 ± 0.1
Natural spread of flowers—width (in.)	2.5 ± 0.2
Pedicel length (in.)	1.7 ± 0.2
Scape length (in.)	6.9 ± 1.3
Spray length (in.)	18.0 ± 4.3
No. of flowers per spray	11.9 ± 3.9
Half life of sprays on plant (days)	64.4 ± 9.4
Vase life—half life of cut sprays (days)	11.0 ± 5.3
Plant height (in.)	21.4 ± 3.1
Percent bud drop	5.9

Flowers lasted remarkably well on the plants. The half life of sprays recorded from September to December, 1989 averaged 64.4 days. The half life was determined as the number of days from the opening of the first flower until half of the flowers on the same spray wither or drop. The

long lasting purple flowers, wide seasonality, uniformity, and short stature are attributes of UH999 as a seed-propagated, flowering potted plant cultivar.

The bud drop percentage was 5.9 which is considered marginal for cut flower purposes. The vase life (half life) was 11.0 days which is comparable to that of UH cut flower cultivars. Thus, during the winter months, besides its major use as potted plants, UH999 might also be used for cut flowers or for leis.

This cross between *D. Evelyn Nakasato* and *D. Jaquelyn Thomas* was registered with the Royal Horticultural Society as *D. Susan Takahashi*. The repeat cross is being released to dendrobium growers associations in Hawaii as *D. Susan Takahashi*, UH999.

H. Kamemoto, T. D. Amore,
and N. C. Sugii

AVAILABLE PUBLICATIONS

Several recent Floriculture publications from the College of Tropical Agriculture and Human Resources (CTAHR) may be of interest.

Carnation Pests

Research Extension Series 107, Diseases and Pests of Carnations, contains sections on pathogen-induced diseases, nutritional disorders, insect pests, and management of diseases and pests. This publication by E. E. Trujillo, R. Shimabuku, C. Hashimoto, and T. M. Hori contains many excellent color photographs to assist in the diagnosis of the problems of carnations.

Genetics of Anthurium Color

A report on the extensive research on the genetics of Anthurium flower color at the University of Hawaii is contained in Research Series 056, Genetics of the Major Spathe Colors in Anthuriums, by H. Kamemoto, R. Y. Iwata, and M. Marutani.

Dendrobium Evaluation

Research Extension Series 105, Evaluation of 16 Seed-propagated Amphidiploid Dendrobium Progenies, by H. Kamemoto, R. S. Kobayashi, and T. D. Amore provides a comparison based on the following: yield and seasonality, height of plant, scape and raceme length, flowers per raceme, percentage of bud drop, size of flowers and pedicel length, and vase life.

Anthurium Phytotoxicity

Excellent color photographs are provided to help identify injury caused by chemicals used in the production of Anthuriums in Research Extension Series 097, Phytotoxicity of Insecticides and Acaricides to Anthuriums, by T. Y. Hata and A. H. Hara.

Single copies of these publications are available from your County Extension Office or by contacting the Agricultural Publications Office, CTAHR, University of Hawaii, 3050 Maile Way, Gilmore 119, Honolulu, Hawaii 96822.

Other Publications

Two related publications that can be obtained by contacting Dr. Arnold H. Hara, Beaumont Research Center, 461 W. Lanikaula Street, Hilo, Hawaii 96720 (935-2885).

HITAHR Brief No. 004-1987 Guide to Chemical Control of Insects and Mite Pests of Orchids.

HITAHR Brief No. 008-1987 Guide to Chemical Control of Insect and Mite Pests of Anthurium.

UH800, UH955, AND UH971 DENDROBIUM

Recently, three new dendrobium cross combinations were released to dendrobium growers associations of Hawaii. UH800 is a white, PPCC, amphidiploid *Dendrobium* Jaquelyn Thomas, and UH955 and UH971 are PPPC type hybrids with essentially three sets of *Phalaenathe* (P) chromosomes and one set of *Ceratobium* (C) chromosomes.

UH800

UH800 (=K840) is one of 16 amphidiploids evaluated recently along with the five UH cultivars, UH44, UH232, UH306, UH503, and UH507, released earlier. Results of the experiment were detailed in HITAHRE Extension Series 105 entitled "Evaluation of 16 Seed-propagated Amphidiploid Dendrobium Progenies," which was published in 1989.

Table 1 compares the characteristics of UH800 with those of UH306. The performance of UH800 (Fig. 1) was about equal to that of UH306 in every characteristic. Consequently, this cross was repeated and released in order to complement UH306, the major white cultivar in commercial cut flower production.

In keeping with the nomenclature of the previously released amphidiploid seed-propagated cultivars—'Uniwai Blush' (UH44), 'Uniwai Supreme' (UH232), 'Uniwai Pearl' (UH306), 'Uniwai Prince' (UH503), and 'Uniwai Princess' (UH507)—we have given the horticultural designation 'Uniwai Mist' for UH800. 'Uniwai Mist' is a cross between our inbred amphidiploid *D. Jaquelyn Thomas* 'K159-21' and amphidiploid *D. Jaquelyn Thomas* 'D192' obtained from Thailand.

UH955

UH955 is a cross made in January 1984 between amphidiploid (PPCC) *D. Jaquelyn Thomas* 'Y166-1' and tetraploid (PPPP) *D. phalaenopsis* 'W15-6.' The lavender-pink flowers (Purple-Violet 81C of R.H.S. Colour Chart) are attractive and fuller (Fig. 2) than the typical Jaquelyn Thomas type cultivars because the offspring have three sets of the P (*Phalaenathe*) genome and one set of the C (*Ceratobium*) genome. The improved individual flower quality is accompanied

Table 1. Characteristics of UH306 and UH800.

Characteristics*	UH306	UH800
Sprays per plant from Aug. '85 to Dec. '87	17.8	17.1
Scape length (in)	8.9	8.3
Spray length (in)	27.1	26.9
No. of flowers per spray	17.8	17.9
Percent bud drop	3.3	5.3
Natural flower length (in)	2.2	2.2
Natural flower width (in)	2.4	2.4
Pedicle length (in)	1.6	1.7
Vase life (days)	17.1	16.4
Mean plant height (in)	41.1	39.4

* Differences between UH306 and UH800 are statistically not significant.



Fig. 1. *D. Jaquelyn Thomas*, UH800



Fig. 2. *D. Joan Kushima*, UH955

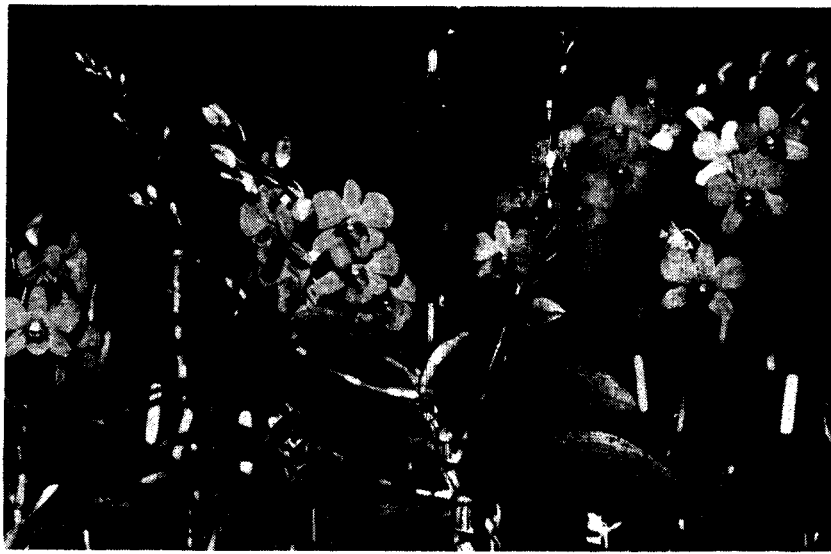


Fig. 3. *D. Elaine Harada*, UH971

Table 2. Characteristics of UH955 and UH971.

Characteristics	UH955	UH971
Sprays per plant from July '86 to June '89	8.6 ± 2.4	10.4 ± 2.8
Scape length (in)	9.7 ± 1.2	7.3 ± 1.5
Spray length (in)	24.1 ± 4.3	19.3 ± 4.7
No. of flowers per spray	14.1 ± 5.6	14.3 ± 4.1
Percent bud drop	1.8 ± 2.1	10.1 ± 8.3
Natural flower length (in)	2.6 ± 0.2	2.4 ± 0.2
Natural flower width (in)	2.6 ± 0.2	2.6 ± 0.2
Pedicle length (in)	1.4 ± 0.3	1.4 ± 0.2
Vase life (days)	13.7 ± 5.6	13.6 ± 6.8
Mean plant height (in)	30.9 ± 4.3	26.8 ± 5.1

by seasonal flowering in fall, both of which are inherited from the *D. phalaenopsis* parent. Also, the total yield is lower than that of Jaquelyn Thomas type cultivars. However, despite its seasonal flowering behavior and relatively low yield, UH955 has been released because of its attractive flowers carried on long straight flower stems. The cross between *D. Jaquelyn Thomas* and *D. phalaenopsis* was registered as *D. Joan Kushima* by Kushima in 1955.

UH971

One of the major objectives of our breeding program has been the development of winter

flowering cultivars. Unlike UH955 which peaks in September and October, UH971 (Fig. 3) has shown good flower production from September to March (Fig. 4). Flowers are attractive dark Red-Purple (R.H.S. Colour Chart 72A).

UH971 is a cross between tetraploid *D. Kai-muki Beauty* 'K119-24' and *D. Jaquelyn Concert* 'D239-1.' Flower characteristics other than the color are similar to those of UH955 (Table 2) except the bud drop percentage. Although bud drop is rather high for UH971, its flower production in winter is a highly desirable feature. Furthermore, individual flowers even on sprays exhibiting bud drop can be used during the win-

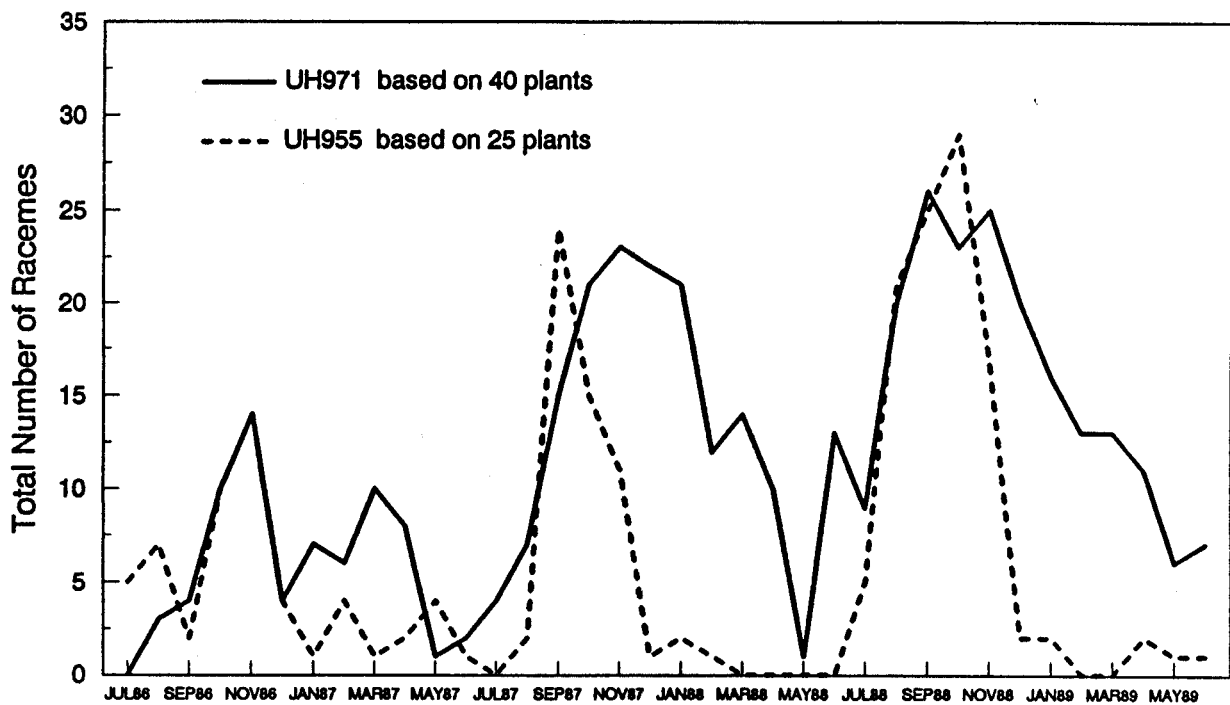


Fig. 4. Weekly raceme yields of *D. Joan Kushima*, UH955, and *D. Elaine Harada*, UH971.

ter season when flowers are in demand. Individual plants in flower are also attractive and, therefore, this cultivar can serve multiple purposes: for cut flowers, individual flowers, and flowering potted plants.

This cross has been registered as *D. Elaine Harada*.

H. Kamemoto, Teresita D. Amore,
and Nellie C. Sugii

'TROPIC FLAME' AND 'BLUSHING BRIDE' ANTHURIUM

Evaluation of two anthurium selections, UH712 and UH798, under advance testing with cooperating growers in East Hawaii was completed. Both selections showed desirable attributes and, therefore, were named 'Tropic Flame' and 'Blushing Bride', respectively. 'Tropic Flame' (Fig. 1) produces attractive large, red, tulip-type flowers while 'Blushing Bride' (Fig. 2) is highly tolerant to bacterial blight. The characteristics of the cultivars are given in Table 1.

'Tropic Flame' (UH712)

'Tropic Flame' is a seedling selection from a cross between 'Calypso' and UH589 (Fig. 3). UH589 was obtained from the cross between

'Trinidad' and 228-33, a seedling selection from a cross between 'Okamoto' and 'Kozohara.' Thus, 'Tropic Flame' has in its background the tulip-type cultivars 'Calypso' and 'Trinidad' which were named and released in 1975. Since both 'Calypso' and 'Trinidad' are relatively small-flowered with pink and coral spathes respectively, we attempted to breed for a large, red, tulip-type flower. The result is 'Tropic Flame.'

The major attribute of 'Tropic Flame' is the novel, large and brilliant red, tulip-type spathe. It is also resistant to anthracnose with yields of 5.6 flowers per year. Its flower stems are long and straight. It has a longer vase life than 'Calypso.' Plants were vigorous during the first year of advance test with cooperators but once bacterial blight set in, many plants died. It does not appear to be as tolerant to the systemic phase of bacterial blight as 'Calypso.'

The major weakness of 'Tropic Flame' is the splitting of the basal lobes during rainy periods. As much as 11 percent of flowers showed splitting at one of the cooperating farms. Several flowers developed pin holes in the basal lobes at the Waiakea Experiment Station.

'Blushing Bride' (UH798)

'Blushing Bride' is extremely tolerant to the systemic phase of bacterial blight. Although

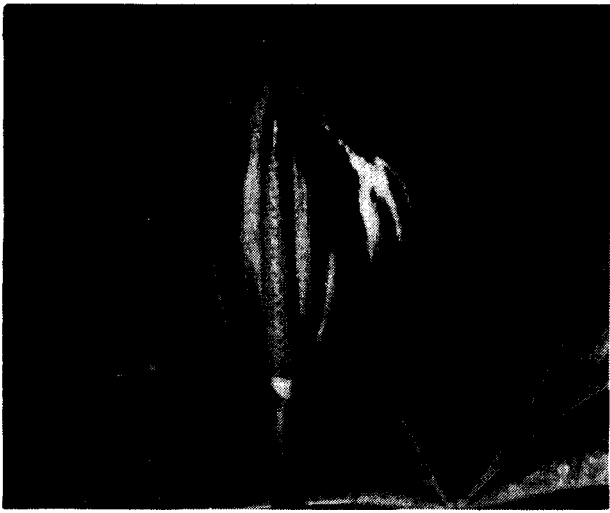


Fig. 1. 'Tropic Flame' Anthurium

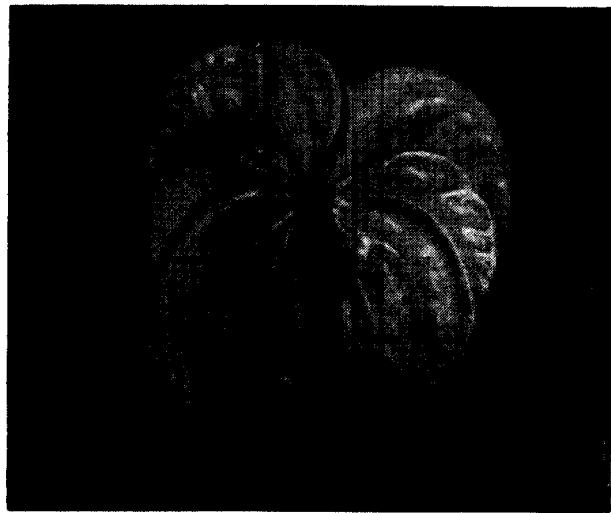


Fig. 2. 'Blushing Bride' Anthurium

Table 1. Characteristics of 'Tropic Flame' and 'Blushing Bride'

Characteristics	'Tropic Flame'	'Blushing Bride'
Spathe		
Size and Shape	Cupped, 150° from flower axis, 5" tall, 4-3/4" wide	Heart-shape, overlapping basal lobes, 6½" long, 5" wide
Color	Bright red (RHSCC45A)	Blush (pink)
Spadix		
Size and Shape	3½" long, 3/8" thick, upright	3-3/4" long, 7/16" thick, reclining
Color	Purplish red	Purplish pink
Anthracnose	Resistant	Resistant
Flower Stem	Long, upright, 33" long, ¼" thick	Upright, 23" long, ¼" thick
Yield	5.6 flowers per year	6.3 flowers per year
Foliage		
Blade	15" long, 10" wide, heart-shape	13" long, 7" wide, overlapping lobes
Petiole	27" long, ¼" thick	19" long, 3/16" thick
Sucker Production	Sparse	Profuse

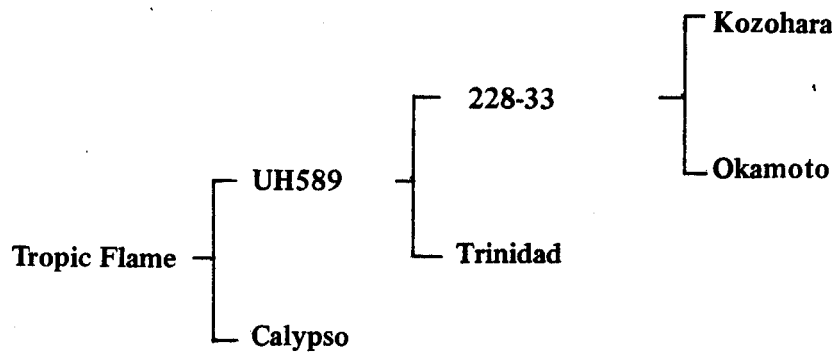


Fig. 3. Pedigree of 'Tropic Flame'

leaves and flowers become infected, we have rarely lost well-established plants due to bacterial blight. A few plants grown at a severely infested nursery in East Hawaii showed good tolerance to the blight.

'Blushing Bride' is a seedling selection from a cross between UH515 ('Fukano' x 'Manoa Mist') and UH146 (a seedling of open-pollinated 'Nita'). The attractive spathes with pink blush are medium-sized. It has a yield of 6.3 flowers per plant per year and is resistant to anthracnose.

'Blushing Bride' suckers freely and, therefore, can be readily increased. If plants are left to proliferate, however, they will remain short in stature and flowers will be small with short stems. It is suggested that keikis be removed to allow no more than two growths per plant. This cultivar is extremely susceptible to diuron injury. Another possible weakness is the rigid and brittle neck of flowers which makes them difficult to pack without neck injury.

H. Kamemoto, J. T. Kunisaki,
M. Aragaki, T. Higaki
and J. S. Imamura

NOTE: The use of trade names is for the convenience of readers only and does not constitute an endorsement of these products by the University of Hawaii, the College of Tropical Agriculture and Human Resources, the Hawaii Cooperative Extension Service, and their employees.

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Extension Specialist in Horticulture