Hawaii Cooperative Extension Service

HORTICULTURE DIGEST

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

Department of Horticulture
University of Hawaii at Manoa

In This Issue: Flower and Nursery Information
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NEW RETARDANTS CONTROL PLUMERIA GROWTH

In the early 70's existing growth retardants, chlorphonium, chlormequat, and daminozide, were found ineffective in retarding the elongation of plumeria branches. In the 1980's several new materials appeared which have been shown highly effective on many woody plant species. Supported by a grant from the Plumeria Society of America, a study was conducted to determine the effectiveness of the new materials.

An advantage to effective height control would be the potential to manage plants more easily in the field and containers. In some other plants, the retardants also stimulate earlier flower bud production, also a potential gain if plumeria responded similarly.

In June 1988, rooted 22 cm cuttings of a selection of *Plumeria rubra* cv. 'Common Yellow' were potted into 15 x 15 cm containers filled with a medium of equal parts soil, peat and perlite. Once root growth had reached the edge of the soil ball, they were treated by drenching with four different growth retardants at 5 concentrations (Table 1). The four retardants are from two chemical families, the triazoles, represented by paclobutrazol and uniconazole, and the pyrimidines, represented by ancymidol and flurprimidol. Initial measurements of the cutting length from the soil line and diameter were taken and stem length from the soil line and stem volume (calculated as a cylinder) were determined 4 months later. The length of time to flower and length of stem at the time of flowering were also recorded.

There were 3 replications of each treatment arranged in a randomized block design. Data were analyzed as a 4 x 5 factorial with determination of the linear effects of dose calculated by the General Linear Models procedure of the Statistical Analysis System program package. Orthogonal contrasts were used to compare growth retardants.

All the chemicals reduced the amount of growth produced by the plants following treatment with increasing concentration (Table 2). At low application rates, there was no significant difference between the triazole compounds and the pyrimidine compounds but due to greater retardation at the two highest rates of flurprimidol mean values for the pyrimidines to be lower than for the triazoles. There was no significant difference between the paclobutrazol and uniconazole treatments. The order of effectiveness was flurprimidol > uniconazole > paclobutrazol > ancymidol when both growth increment and amount of chemical applied were considered.

Stem volume of the increment of growth was also reduced with the increase in concentration, but this generally reflected the reduced length increment rather than stem diameter. The two triazole materials had a significantly greater effect than did the pyrimidines however (data not presented).

The retardants delayed flowering as concentration was increased (Table 2), but there was no significant difference between the means of the two chemical groups; however, the trends of the data suggest that flurprimidol had a greater delaying effect than did the other materials. Flower size and number were not determined. Except for the higher rates of flurprimidol, there appeared to be little effect of chemical on stem length at flowering time (data not presented).

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Table 1. Growth retardants and rates applied as soil drenches to potted plumerias.

Material Name		Rates				
Common	Trade	0	1	2	3	4
				(Mg/pot)		
Ancymidol	Arest	0	15.0	30.0	60.0	120.0
Flurprimidol	Cutless	0	0.025	0.05	0.1	0.2
Paclobutrazol	Bonzi	0	0.25	0.5	1.0	2.0
Uniconazole	Sumagic	0	0.05	0.1	0.2	0.4

Table 2. Effects of growth retardants on stem length increase 4 months after treatment and days to flower from treatment date for young plants of *Plumeria rubra* 'Common Yellow'.

Rate	ANCY	FLUR	PACLO	UNICON	Rate Mean
	Increment of stem length increase (cm)				
0	29.5	28.1	29.8	28.8	29.0
1	27.0	23.6	27.5	27.7	26.3
2	25.9	24.9	25.9	24.6	25.2
3	24.0	19.3	23.8	23.7	22.7
4	22.5	17.9	21.8	21.5	20.8
Chem. Mean	25.8	23.1	25.7	25.3	
	Days to flower from treatment date (6/30/88)				
0	165	195	175	173	177
1	183	203	183	183	190
2	182	208	181	197	193
3	199	219	200	195	203
4	206	228	221	211	216
Chem. Mean	187	210	192	194	

The study is being continued to determine if a carryover effect can be measured in the 1989 growing season.

Eunoh Kwon, Graduate Student
Richard A. Criley, Professor

COMING EVENTS

Ornamental Short Course

The 14th Annual Ornamental Short Course will be held March 25–26, 1991 at the Kauai Hilton and Beach Villas. The program will include a general session in the morning (Trends: Past, Present and Future) and three concurrent sessions in the afternoon (Landscape, Nursery and Cut Flowers), followed on the second day by an industry tour. Featured speaker will be Dr. Carl E. Whitcomb of Stillwater, Oklahoma.

Anthurium Conference

The Hawaii Anthurium Industry Conference will be held on May 22–23, 1991 in the Campus Center Building on the Campus of the University of Hawaii at Hilo. Contact Wayne Nishijima

(959-9155) or Dr. Deardorff (935-2855) for further information.

Mid-term Turf Conference
The Hawaii Turfgrass Association will hold their Mid-term Turf Conference at the Maui Marriott, May 23–24, 1991. Call HTA at 836-2468 for further information.

Papaya Conference
The Hawaii Papaya Industry Association will hold their Annual Conference in Hilo, June, 1991. For further information contact Leng Chia, 3190 Maile Way, Honolulu, HI 96822. (808) 956-7899.

Horticulture Show
The Hawaii State Horticulture Show will be held June 27–29, 1991 at the Tennis Stadium in Hilo. Contact Jason Hashimoto (965-9522) or Kelvin Sewake (959-9155) for further information.

Ohio Short Course
The International Floriculture Industry Short Course sponsored by Ohio State University and the Ohio Florist's Assn. is scheduled for July 13–17, 1991. The program features more than 700 exhibitor trade show, workshops, design contest, and various seminars. Contact Ohio Florist's Assn. 700 Ackerman Rd, Suite 230, Columbus, OH 43202 (614-267-1117).

Florist Convention
The Society of American Florists will hold their 107th Annual Convention (Islands of Opportunity) at the Westin Kauai on July 24–27, 1991. Call SAF at (808) 336-4743 for complete convention information.

Herb Conference
The Hawaii Herb Association will hold their Third Annual Conference and Tour at the Airport Holiday Inn in Honolulu August 9–10, 1991. Contact Alice Kadowaki at 988-6664 for information.

Plant Propagators
The Western Region of the International Plant Propagators' Society (IPPS) will hold their annual meeting at the Greenwood Inn in Beaverton Oregon, September 3–6, 1991. Contact Wilbur Bluhm, 743 Linda Avenue N.E., Salem, Oregon 97303 (503-393-2934) for further information.

Turf Conference
Plans are to hold the Annual HTA Conference and Trade Show at the Sheraton Makaha Resort and Country Club on Oahu, October 2–4, 1991. Call HTA at 836-2468 for further information.

HAN Conference
The Hawaii Association of Nurserymen Annual Conference and Mid-Pacific Horticultural Show is scheduled for Hilo, Hawaii on October 14–17, 1991. The trade show will be increased from 76 to 128 booths. Dr. Charles A. Conover, Director of the Research and Extension Center at Apopka, Florida will be the featured speaker.

TIPE Show
The Tropical Plant Industry Exhibition (TIPE) will be moving to the Greater Ft. Lauderdale/ Broward County Convention Center in Ft. Lauderdale, Florida for the 1992 Show, January 23–25. Contact the Florida Nurserymen and Growers Association, 5401 Kirkman Rd., Orlando, FL 32819 (407-345-8137) for information.

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, Honolu, 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.

PROPAGATING NATIVE HIBISCUS

Hibiscus is a popular plant in Hawaii. Many people grow hibiscus but few realize the wealth of unique native species that Hawaii possesses (Table 1). Have you ever smelled a *fragrant* hibiscus? Hawaii has several. Have you seen our "new" state flower, the striking yellow Ma'o Hau Hele? It is amazingly easy to grow. (It was selected by Hawaii's legislature in 1988, replacing the red hibiscus which was the floral emblem of the territory of Hawaii.)

Like many plants, hibiscus in Hawaii has undergone cycles of popularity. In the early 1900's the hibiscus was extremely popular. Many people grew hibiscus and cross pollinated them to make new hybrids. In 1911 a hibiscus society was formed in Hawaii. In 1923 a law was passed making the red Hawaiian hibiscus the official flower of the Territory of Hawaii.

The fragrant Hawaiian whites readily set seed and therefore make good "mother" plants for creating new varieties. They have been hybridized with other native Hawaiian hibiscus, and with hibiscus from other parts of the world like Fiji, Africa, and Asia. Many of the hybrid hibiscus in cultivation today have some Hawaiian genetic material because the natives are so easy to hybridize.

The hibiscus is considered easy to propagate. Plants may be grown from cuttings, air layers, grafts or seeds. They may also be grown by a combination of grafting and cutting propagation. In this method a scion is grafted to an unrooted stock and the stock/scion is then rooted in the mist box.

SEEDS:

Because hibiscus do hybridize so readily, growing plants from seeds may not always give you a plant that is the same as the parent. (It might be a hybrid with another hibiscus that is in the vicinity.) Therefore, to insure that the offspring is like the parent, self-pollinate the flower and put a bag around it until the seed capsule ripens. This will keep any stray "Cupid" bees and other pollinators from cross pollinating the flower. Take some pollen from the parent plant, put the pollen on a paintbrush (or your finger) and rub it onto the stigma. This is best done early in the morning.

Once the seed capsule forms and turns brown, the seeds are mature. The seeds are brown and fuzzy. You can plant the seeds in clean potting mix in a clean pot. Water daily and transplant the seedlings to individual pots when they have two sets of leaves.

GRAFTING:

Grafting is one of the best ways to grow native hibiscus. You don't need a lot of fancy expensive equipment, and hibiscus is one of the easiest plants to graft. Most introductory grafting classes start the students by practicing on hibiscus.

The tools required for grafting are: sharp grafting knife, raffia, paraffin wax, a can to melt wax in and paintbrush to apply the wax. The rootstock (the plant you graft onto) can be any tough type of hibiscus. Common red and pink waterfall both work well. These can easily be rooted by taking an 8–10 inch cutting, removing all the leaves and sticking it in a pot of potting mix. Water the cuttings daily and when they are well rooted (firm in the pot) you can graft your special scion piece onto the stock.

The scion should be about three to four inches long, of semi-mature wood, and with two to four potential leaf buds. Most people prefer tips for the scion but stem pieces will also work. Ideally, the stock and the scion should be about the same diameter. Cut the scion piece in a wedge shape. On the rootstock, cut the top off straight and make a slice down the middle of the stem, wedge the scion piece into the slice. Match up the cambiums (the green slippery part inside the bark) of the rootstock and scion. This is the top wedge grafting method. Wrap the pieces together with raffia and then cover the raffia and any exposed areas with liquid (but not too hot) wax. (Test the wax as you would a baby's milk– put a dab on your inner wrist. If it doesn't burn your skin it is ok for the hibiscus.)

Another grafting method is the side wedge. Leave the top of the rootstock growing. Cut a slice into the stem and wedge the scion into that. Wrap with raffia and coat with wax as in the top wedge method.

(You can also root the rootstock and graft in one operation but this requires a misting setup which not everybody has.)

CUTTINGS:

Hibiscus is usually propagated by cuttings. This generally requires the use of a mist system. (The old fashioned way of sticking the cuttings in water or directly in a pot of potting mix or soil does not work too well with the natives although a few will root). *Hibiscus brackenridgei* and *Hibiscus callophyllus* are exceptions, they will root fine by putting several cuttings in a pot of potting mix (such as 1:1 peat moss:perlite) and watering then about twice a day.

One of the main things for good success with cuttings is the health of the parent plant. The cuttings should look vigorous but not have a high nitrogen content (Don't over fertilize with nitrogen fertilizers). Generally cuttings growing upright on the parent plant will root best.

A good size for cuttings is about ½" or less in diameter, and 4–6" long. All of the lower leaves should be cut off. The top third of the leaves should be cut in half. (Some growers remove all of the leaves, but the leaves, especially the tip ones, probably enhance rooting due to their natural hormones).

There are many methods and each grower has his own preference. Bob Hirano of Lyon Arboretum recommends a rooting mixture of perlite and vermiculite; a mist cycle of 24 seconds/3 minutes and a liquid rooting hormone dip in 1:10 Dip-n-Gro.

Alice Kadowaki, formerly of Kilgos, had a fog system, where the air is always saturated with moisture. She used a potting mix with fertilizer so the cuttings can get nutrients right from the start. She claims that under these conditions soft succulent tips root within one week.

Table 1. Hibiscus: Summary of Hawaiian Species.

Latin Name	Hawaiian Name	Common Name
H. waimeae	Koki'o ke'oke'o	Kauai White
H. arnottianus	Koki'o ke'oke'o	Oahu White
H. immaculatus	Koki'o ke'oke'o	Molokai White
H. kokio	Koki'o 'ula	Hawaiian Red
H. brackenridgei (Hawaii's State Flower)	Ma'o Hau Hele	Hawaiian Yellow
H. saintjohnianus	Koki'o 'alani	Kauai Orange
H. calyphyllus (some authorities believe that this is not native to Hawai'i)		Rock's Kauai Hibiscus

Other possible rooting media are: perlite, a mixture of fine and coarse perlite, vermiculite, perlite and vermiculite, cinder and perlite, or cinder, vermiculite and perlite.

Some people use Hormex rooting hormone in various strengths, Rootone F with fungicide, different concentrations of Dip-n-Gro or other liquid hormones, and some people, considering hibiscus easy to root, use no rooting hormone at all.

Much of this has to do with personal preference, growing conditions, and cultivar or species of hibiscus being grown. Speed of rooting and amount of roots, are enhanced by the use of hormones. Rootone F is a good hormone for most conditions.

AIR LAYERS:

Hibiscus is easy to grow from air layers and this is another method that is easy for most gardeners. It requires even less fancy equipment and technique than grafting. You need moist sphagnum moss, a sharp knife, rooting hormone, plastic, twist ties, and labels. Cut a one inch wide ring of bark off the plant stem that you wish to air layer. Scrape the cambium off by holding the knife perpendicular to the stem and gently scraping the green slippery cambium off. Apply rooting hormone to the cut surface, cover with a handful of sphagnum moss and wrap with plastic, secured at both ends with twist ties. Make sure the moss is moist but not soggy, and that the ends are tied so water cannot get in. Attach a label with the date of propagation and other notes (strength of rooting hormone, time of day, etc). Wait for roots to be visible through the plastic, then cut off the layer, pot it in a pot that is just a little larger than the root ball (a one gallon pot usually works well), water daily and when the plant is strong and well rooted in the pot, transplant it into the ground or into a larger pot.

One note of caution about air layers is to be patient and not overly ambitious. Select a branch that is growing upright, and that is not too large (two feet long at the most). Remember that the roots which form must supply water and nutrients to the whole branch once it roots and is cut off. Pick a branch that is about one foot long for best success.

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NURSERY NOTES

Some recent reports of interest from HortScience, a journal of the American Society for Horticulture Science.

SIZE AND FLOWERING OF SEED-PROPAGATED GERANIUMS IN RESPONSE TO FUNGICIDE DRENCHING SCHEDULES

M. K. Hausbeck, C.T. Stephens, and R. D. Heins
Michigan State University, East Lansing,
MI 48824-1312

Additional index words: fenaminosulf, metalaxyl, Pelargonium Xhortorum, Phythium ultimatum

Abstract. Two fungicides registered for the control of Pythium spp. were evaluated for their effects on size and time to flowering of seed-propagated geraniums (Pelargonium Xhortorum L.H. Bailey). Fungicide drenches of fenaminosulf and metalaxyl were applied to geraniums grown in soilless root medium: 1) at seeding (S); 2) at seeding and transplanting (ST); 3) at seeding, transplanting, and 1 week after transplanting (ST + 1); 4) at transplanting (T); and 5) 1 week after transplanting (T + 1). Metalaxyl drenching schedules did not significantly influence plant size or time to flowering. Fenaminosulf drenching schedules 3 and 4 significantly reduced plant size, and drenching schedule 3 significantly increased days to flowering in comparison to control plants. Although fenaminosulf is used infrequently because of limited availability, the detrimental effects of this fungicide on plant size and time to flowering warrant similar investigations with additional fungicides and crops. Chemical names used: sodium[4-(dimethylamino)phenyl] diazenesulfonate (fenaminosulf); N-(2,6-dimethylphenyl)-N-(methoxyacetyl)-DL-alanine methyl ester (metalaxyl).

INFLUENCE OF PHOTOPERIOD AND TEMPERATURE ON THE GROWTH AND FLOWERING OF HELICONIA AURANTIACA

Vibeke Geersten
Danish Research Service for Plant and Soil Science, Institute of Glasshouse Crops, Aarslev DK-5792, Denmark

Additional index words. cut flower

Abstract. The effect of photoperiod (8,12, or 16 hr) and temperature (15,18, or 21C) on Heliconia aurantiaca Ghiesbr. ex. Lemaire was investigated. By exposing plants to a photoperiod of 8 hr, flowering was more advanced and more abundant, fewer leaves subtended the inflorescence, and the length of the flowering stems was shorter than at 16 hr. Raising the temperature from 15 to 21C increased the flowering percentage by = 20%; the flowering stems were 40 cm longer and the number of leaves subtending the inflorescence was increased by 2.5.

CHLORMEQUAT CHLORIDE GROWTH RETARDANT REDUCES SPIDER MITE INFESTATIONS OF HIBISCUS ROSA-SINENSIS

L. S. Osborne and A. R. Chase
University of Florida, IFAS, Central Florida Research and Education Center, 2807 Binion Road, Apopka, FL 32703

Additional index words. integrated pest management, CCC

Abstract. Hibiscus rosa-sinensis L. plants treated three times with 850 mg liter^{-1} of the growth retardant chlormequat chloride (CCC) were less susceptible to infestation with Tetranychus urticae (Koch) that water-treated control plants. The difference in mite numbers was noted within 8 days after releasing mites onto test plants. Mean number of mites per treated plant was 3.7, compared to 30 on nontreated plants. This activity was observed on all treated plants 6 months after applying CCC. Significant differences were observed on treated plants that were defoliated and allowed to produce new foliage before being evaluated. Therefore, surface chemical residues were not responsible for reducing mite infestations on CCC-treated plants.

WEED INTERFERENCE IN CONTAINER-GROWN 'SAN JOSE' JUNIPER

Kandy L. Walker and David J. Williams
Department of Horticulture, University of Illinois, Urbana, IL 61801

Additional index words. Juniperus chinensis 'San Jose', Echinochloa crusgalli, Digitaria sanguinalis, Setaria faberi, barnyardgrass, large crabgrass, giant foxtail

Abstract. Experiments in two consecutive years indicated that barnyardgrass (Echinochloa crusgalli L.), large crabgrass (Digitaria sanguinalis L.), and giant foxtail (Setaria faberi Herrm.) reduced growth of container-grown 'San Jose' juniper (Juniperus chinensis L. 'San Jose') 83 days after transplanting grass seedlings into the containers. Grass densities of one to six weeds per container reduced 'San Jose' juniper growth. By 83 days of grass interference, juniper shoot dry weight was reduced as much as 43% by six weeds per container.

CYTOKININ AND ETHEPHON INDUCE GREATER BRANCHING OF PRUNED PLUMERIA

As landscape specimens and under field culture for lei flower production, plumeria trees can attain sizes unsuitable for the space allocated. Pruning is practiced to reduce plant size and stimulate the production of new branches. Some cultivars of plumeria produce quite long branches before flowering and are undesirable because of leggy growth.

Depending on cultivar, plumerias produce from 3 to 5 branches immediately below a flowering terminal. A single branch, however, seldom branches without the release of apical dominance by either flowering or pruning. The number of lateral branches produced is likely related to the size of the stub remaining after pruning and the health and vigor of the tree prior to pruning. For both cultural control in commercial flower production and landscapes as well as for plants grown in containers, it is desirable to increase lateral shoot production after pruning.

Plant growth regulators known to influence bud break include the natural hormones, cytokinin and ethylene. Synthetic cytokinins such as kinetin, N-6-benzyladenine, and PBA are known to mimic the effects of the natural ones, and the growth regulator, ethephon, causes the production of ethylene in plants with a concomitant ethylene effect.

In this experiment, the cytokinin PBA (ACCEL) and ethephon (FLOREL) were evaluated for their capacities to stimulate bud break on shoots which had the terminals removed by pruning. Single-stemmed two year olds plants of *P. rubra* 'Common Yellow' were repotted from 15 x 15 cm pots into 35 x 22 cm pots containing a medium of equal parts soil, peat, and perlite. Three weeks later, the plants were decapitated 30 cm above the soil line, and thin rubber tubes cut from the stems of balloons were affixed to the distal ends. A volume of 2 ml growth regulator solution was poured into the open end of the tube to be absorbed into the cut surface. The concentrations used for each chemical were 0, 250, 500, and 1000 ppm.

Four plants were used for each treatment and these were arranged in a completely random design on an outdoor bench. The numbers of shoots initiated and surviving and length of these shoots were determined 4 months after treatment. The number of days to bud break was determined for each plant. The data were analyzed as a 2 x 4 factorial using the General Linear Models procedures of the Statistical Analysis System package.

Both chemicals stimulated more bud break and a higher number of elongating shoots 4 months after treatment than occurred on the controls (Table 1). There was a slight statistical superiority of the cytokinin over the ethephon for shoot numbers but the final mean percentage values were not different. It had been expected that slightly retarded shoot growth would occur with the ethephon. Shoot length was inversely related to the number of shoots which survived and elongated, probably due to competition effects. There was a slight hastening of bud break due to the application of the chemicals (Table 1).

The method of application was somewhat unique because there was no leaf surface for foliar uptake of chemicals had they been sprayed. Soil drenches have been shown effective as have lanolin paste applications to stems,

Table 1. Effects of PBA cytokinin and ethephon on initial and surviving lateral breaks, length of lateral breaks 4 months after treatment, and number of days to bud break on *Plumeria rubra* 'Common Yellow'.

Chemical	Rate (ppm)	Days to Bud Break	No. Shoots		Percent Surviving @ 4 mon.	Shoot Length (cm)
			Initiated	Surviving		
PBA	0	46	2.2	1.6	80	8.1
	250	45	2.4	1.8	80	7.9
	500	46	2.8	2.4	86	6.5
	1000	43	3.2	2.6	83	5.0
Chem. Mean		45	2.8	2.3		6.5
Ethephon	0	48	1.8	1.4	83	8.2
	250	48	2.2	1.8	86	7.8
	500	46	2.6	2.2	75	6.3
	1000	44	3.0	2.6	82	5.0
Chem. Mean		46	2.6	2.2		6.4

although this is a messy system. Since the tube system would be somewhat cumbersome for treating large number of plants, not to mention larger diameter branches, alternative application methods need to be evaluated. Future work will attempt to find more efficient methods of application as well as to identify the carrying capacity of shoots as related to branch diameter.

Eunoh Kwon, Graduate Student
Richard A. Criley, Professor

AVAILABLE PUBLICATIONS

Dr. Arnold H. Hara, Entomologist at the University of Hawaii–Manoa, has developed a number of HITAHR Briefs on some of the ornamental insect pests that he has been working on. These can be obtained by contacting him directly at the Beaumont Research Center, 461 W. Lanikaula St., Hilo, HI 96720.

HITAHR Brief No.	Title & Author(s)
073	*Identifying Anthurium Flower Injuries (limited quantites)* B. C. Bushe, W. T. Nishijima, A. H. Hara & D. M. Sato
082	*Red & Black Flat Mite on Anthurium* A. H. Hara, K. T. Sewake & B. C. Bushe
083	*Cardamon Thrips on Flowering Ginger* D. M. Tsuda & A. H. Hara
086	*Anthurium Thrips* A. H. Hara, K. T. Sewake & T. Y. Hata
087	*Anthurium Whitefly* A. H. Hara, K. T. Sewake & T. Y. Hata
088	*Questions and Answers about Integrated Pest Management* K. T. Sewake, A. H. Hara, W. T. Nishijima & B. C. Bushe
089	*Black Twig Borer on Anthurium* A. H. Hara & K. T. Sewake

Also available as Res-Ext Series 097 is Phytotoxicity of Insecticides and Acaricides to Anthuriums by T. Y. Hata and A. H. Hara.

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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