

# Garden Club of Honolulu & Lyon Arboretum- Tropical Ornamental Plant Propagation & Care

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# *Hibiscus Overview*

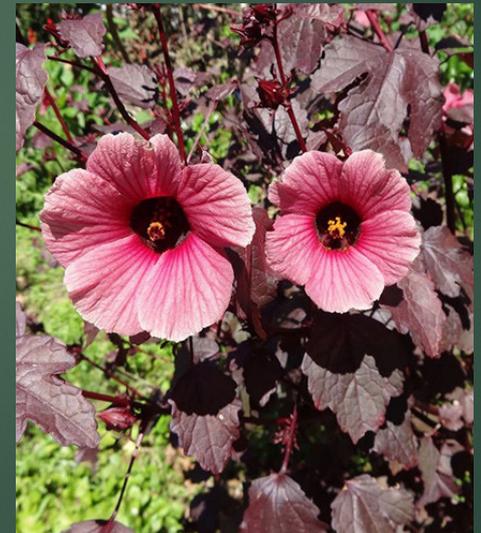
- ▶ Habit- shrubs to small trees
- ▶ Light Level- full sun (6+ hours/day), develop proper coloring, and bloom well
- ▶ Water- consistent moisture throughout the year
- ▶ Soil/Potting Media- acidic, rich in organic matter, but well-drained
- ▶ Nutrient Requirements- fertilize when planting and annually in Spring
  - ▶ best fertilizers are high in potassium (K), medium nitrogen (N), and low phosphorus (P) i.e. NPK of 10-5-20



*Hibiscus arnottianus*



*Hibiscus rosa-sinensis*



*Hibiscus acetosella*

# Hibiscus Propagation

- ▶ Cuttings of green or semi-green material 4-6" long w/ majority of leaves removed
  - ▶ Treat cut end with hormone & stick in well drained medium in humid environ.
- ▶ Seeds need to be scarified and typically will not grow "true"
- ▶ Hibiscus are also relatively easy to graft



# *Hibiscus- Pests & Diseases*



# *Hibiscus*- Modern Hybrids



Hidden Valley Hibiscus

# *Hibiscus*- Native Hawaiian Species



# Gingers- *Hedychium*

- ▶ Habit- herbaceous perennials up to 6' tall, can spread into adjacent areas via rhizomes
- ▶ Light Level- partial shade, < 4 hours of full sun
- ▶ Water- consistent moisture, but rhizomes can rot if soil doesn't drain well
- ▶ Soil/Potting Media- well-drained & rich in organic matter
- ▶ Nutrient Requirements- fast-growing heavy feeders needing a well balance all purpose fertilizer i.e. 13-13-13



*Hedychium flavescens*



*Hedychium*  
'Vanilla Ice'



*Hedychium longicornutum*

# Gingers- *Hedychium*

## ▶ Propagation

- ▶ Rhizome divisions will establish & flower quickly
- ▶ Seedlings take 2+ years to flower

## ▶ Pests & Diseases

- ▶ Relatively few pests and diseases
- ▶ Aphids, mealy bugs, slugs and snails
- ▶ Rhizomes prone to fungal issues if planted too deep or in soil w/ poor drainage



Potential bio-controls for invasive ginger



Rhizome w/growth point



Sprouting rhizomes

# Gingers- Hirano *Hedychium Hybrids*



'Betty Ho'



'Honey Girl'



'Stella'



'Taylor's Delight'

# Gingers- *Hedychium gardnerianum*

- ▶ Pretty and fragrant but HIGHLY INVASIVE
- ▶ Introduced as ornamental in 1940's and has invaded sensitive native ecosystems across the state, displacing native understory

## Kahili ginger recalls royalty, but it is not native

### Kia'i Moku

By Art Medeiros



Vast areas of native rain-forest are being lost to an alien plant with a Hawaiian name. Kahili ginger, named for the flower's

resemblance to the feathered standard carried by Hawaiian royalty, is anything but a Hawaiian plant.

There are three common cultivated species of gingers (genus *Hedy-chium*) or gingerlilies as they are sometimes called in Hawaii. These are the white (*H. coronarium*), the yellow (*H. flavescens*) and the kahili (*H. gardnerianum*). None are native to Hawaii. All three originated in the Himalayas of southern Asia.

Two of these species were introduced by the earliest of our Chinese immigrants, yellow ginger around 1850 and white ginger around



Left: A dense stand of kahili ginger dominates the ohia forest understory in Waikamoi  
Photo courtesy of Art Medeiros

Far Left: The kahili ginger's red fruit is attractive to birds which feed on it and, thus, help spread the plant  
Photo courtesy of Forest and Kim Starr

far and wide. My dissertation research, conducted in Maui's own Kipahulu Valley, documented that the fruits of kahili ginger are dispersed by two very common non-native birds of Hawaiian forests -- the mejiro and the red-billed leiothrix. This fact, plus the ability of this plant to germinate and thrive with no natural enemies, has placed kahili ginger in the top-ten most wanted list of Hawaii's land managers.

guel, Pico, Flores, and Terceira islands) and Madeira, Jamaica, La Reunion in the Indian Ocean and New Zealand.

A friend of mine who lives on Kauai, where kahili ginger is rampant, recently went trekking in Nepal and northern India, where the species is native. She observed, "Being so familiar with it at Kokee, I can spot kahili ginger even without trying. In 25 days of trekking, I saw it only twice. And those patches seemed



Photo: Forest and Kim Starr

# Gingers- *Etilingera*

- ▶ Habit- herbaceous perennial up to 15 ft. spreading laterally from rhizomes
  - ▶ Leafless flower stalks arise from rhizome
- ▶ Light Level- full sun to partial shade, but not intense mid-day sun
- ▶ Water- consistent moisture but not saturated for long periods
  - ▶ Mulch can help to maintain soil moisture but shouldn't contact stems
- ▶ Soil/Potting Media- rich in organic matter but well-drained
- ▶ Nutrient Requirements- feed regularly w/complete all-purpose fertilizer
  - ▶ Amend soil w/potassium before planting



# Gingers- *Etilingera*

## ▶ Pests & Diseases

- ▶ No serious insect or disease issues
- ▶ Aphids, chewing insects, root rot

## ▶ Propagation

- ▶ Rhizome divisions
  - ▶ Best to take divisions when plants aren't flowering
- ▶ *E. corneri* has prop roots that should not be buried
- ▶ Seeds- *Etilingera venusta* (Malay Rose)



# Gingers- *Etlingera*

- Uses- Flower buds used for SE Asian salad, cut flower arrangements



Bunga Kantan- torch ginger, pineapple, & cucumber salad

## Kantan

SCIENTIFIC NAME	: <i>Etlingera elatior</i> (Jack) R.M. Sm.
FAMILY	: Zingiberaceae
VERNACULAR NAMES	: Kantan, bunga siantan, tepus kampung
PARTS USED	: Flower, fruit, rhizome

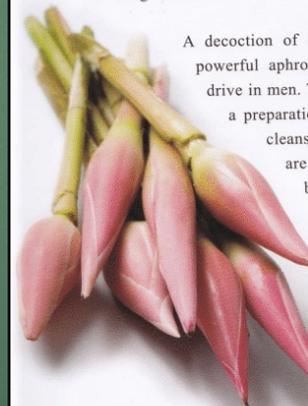


Kantan plants

*Etlingera elatior*, locally known as kantan, is an aromatic, perennial and tough herb that grows up to a height of almost 7 m. It produces thick rhizomes almost at ground surface but sometimes deep under the soil. The stems and leaves are usually close together. The flower is cone-shaped, fragrant and deep pink with yellow or white margins. The fruit is globose and cylindrical, each fruit growing together with others in a fruiting head. It has silky hair, is green when young and turns reddish pink when mature. This herb grows well in primary and secondary forests, forest edges and villages. It can be found growing only at lower elevations. It is widely and commonly cultivated and traded fresh at local markets. Kantan is used as an ingredient and in flavoring dishes as well as eaten raw as fresh vegetables or 'ulam'.



Kantan fruiting head



Kantan flowers

A decoction of the fruit is traditionally used as a powerful aphrodisiac and helps to increase sexual drive in men. The decoction is used for earache and a preparation of the leaves is used to treat and cleanse wounds. In postnatal care, the leaves are mixed with other ingredients for bathing and to eliminate body odours. The plant is also claimed as a traditional remedy for high blood pressure and diabetes.



Kantan provides a lovely fragrance in Malaysian cuisines

# Gingers- *Alpinia*

- ▶ Habit- herbaceous perennial, 3-15 ft. tall depend on species or hybrid, spreads laterally via rhizome
- ▶ Light Level- partial shade to full sun, lots of bright indirect light
- ▶ Water- consistent moisture, do not allow soil to dry out
- ▶ Soil/Potting Media- fertile and well-draining
- ▶ Nutrient Requirements- consistent feeding every 3 months w/complete all-purpose fertilizer
- ▶ Pests & Diseases- aphids, mealy bugs, banana mosaic virus



# Gingers- *Alpinia*

- ▶ Propagation
  - ▶ Aerial off-shoots
  - ▶ Rhizome divisions
  - ▶ Seeds (*A. zerumbet*)
- ▶ Uses- Galangal (SE Asian ingredient), cut flower, shell ginger- Okinawan diet



# *Anthurium*

- ▶ Habit- terrestrial to epiphytic understory perennials
  - ▶ High humidity & good air flow
- ▶ Light Level- shade w/indirect light no full sun (70% shade cloth)
- ▶ Water- consistent but never saturated
- ▶ Soil/Potting Media- very well-draining chunky
  - ▶ Can be mounted to a tree w/textured bark using sphagnum moss, tree fern trunk
- ▶ Nutrient Requirements- feed conservatively with all-purpose slow release or water-soluble fertilizer at  $\frac{1}{4}$  strength
  - ▶ additional phosphorus (K) for flowering



# *Anthurium*

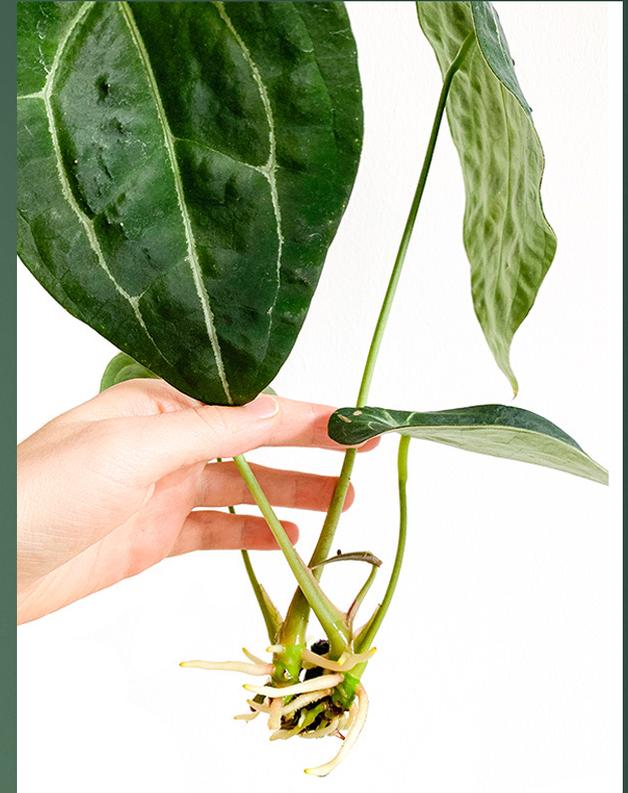


## ▶ Pests & Diseases

- ▶ Mealy bugs, thrips, spider mites
- ▶ Very susceptible to fungal & bacterial diseases
- ▶ Good airflow, sanitation protocols, and preventative pesticide applications are key

## ▶ Propagation

- ▶ Seed germination
- ▶ Divisions
- ▶ Stem “chonks”
- ▶ Tissue culture



# *Cordyline* (Ti)

- ▶ Habit- palm-like woody perennial growing to 15' tall w/a wide variety of leaf sizes and colors
- ▶ Light Level- full sun to partial shade
  - ▶ affects color and vibrance of foliage
- ▶ Water- consistent moisture, but can handle short dry periods
- ▶ Soil/Potting Media
  - ▶ slightly acidic, well-drained, and fertile
- ▶ Nutrient Requirements
  - ▶ Fast growing = heavy feeder
  - ▶ All-purpose complete fertilizer
  - ▶ i.e. 10-10-10 slow release



# *Cordyline* (Ti)

## ▶ Propagation

- ▶ Stem cuttings very easy to root with or w/o leaves
- ▶ Stems can be rooted vertically or horizontally
- ▶ Seeds from ripe fruits germinate within 6 weeks but won't be true



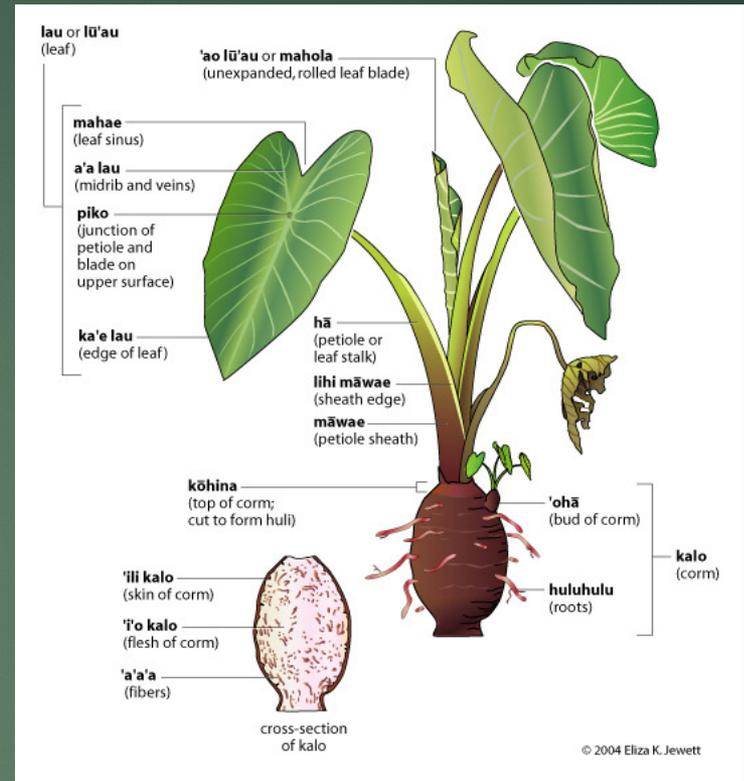
## ▶ Pests and Diseases

- ▶ Thrips, mites, scale insects
- ▶ Bacterial & fungal leaf spot
- ▶ Fluoride toxicity
- ▶ Ti ringspot virus



# *Colocasia* (Kalo)

- ▶ Habit- herbaceous perennial widely cultivated in wetlands growing 3-6' tall
- ▶ Light Level- full sun
- ▶ Water- consistent & ample water but not stagnant
  - ▶ upland (mala) vs wetland (lo'i)
- ▶ Soil/Potting Media- Well-drained, slightly acidic, rich soil w/ plenty of organic matter
  - ▶ Compost can help to add nutrients & structure to soil
  - ▶ Peat-based soils good for growing in pots
- ▶ Nutrient Requirements- all purpose water-soluble fertilizers are best for containerized growing
  - ▶ Bone meal- good source of P & Ca



# *Colocasia* (Kalo)

## ▶ Propagation

- ▶ Oha- off-shoots from corm
- ▶ Huli- stem & top of corm
- ▶ Tissue Culture plants

## ▶ Pests & Diseases

- ▶ Widely cultivated for many centuries so many pests & diseases



DMV

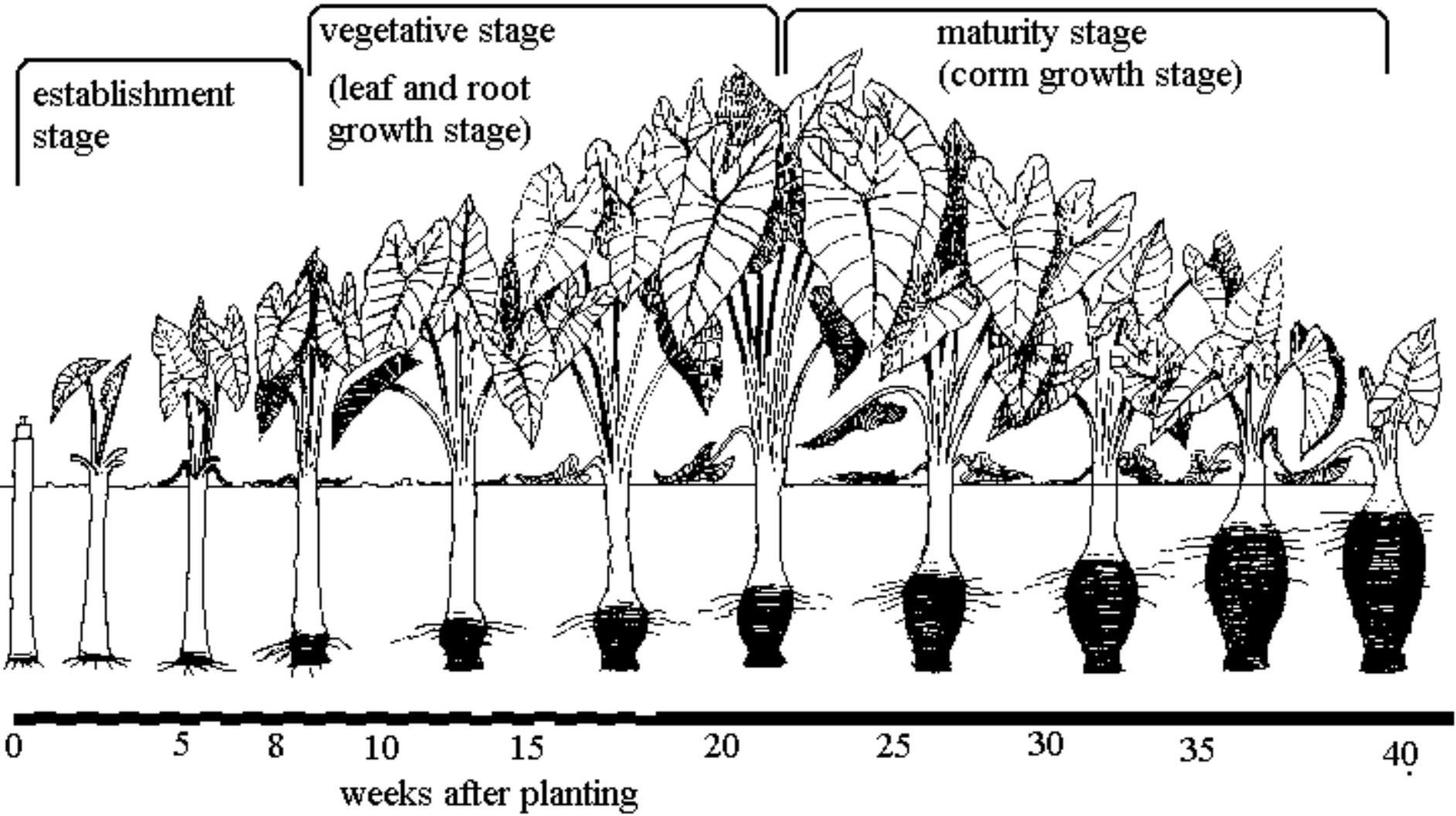


Apple Snails



Leaf Blight

62.10 Life Cycle of Taro

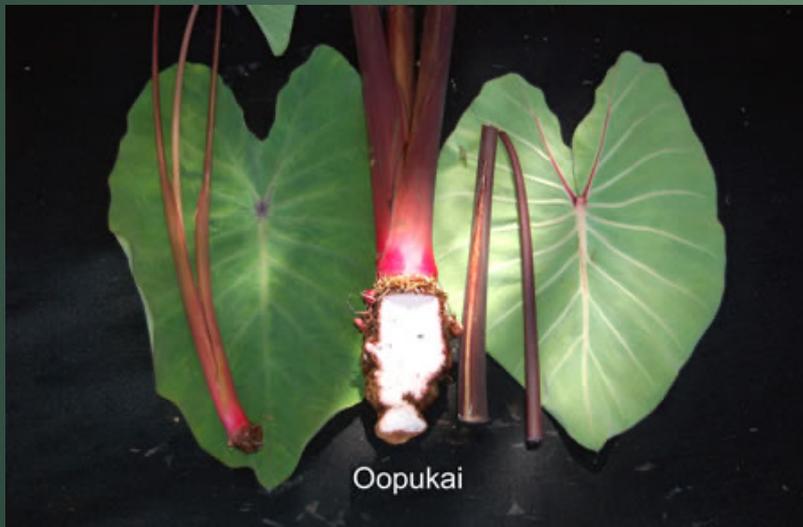
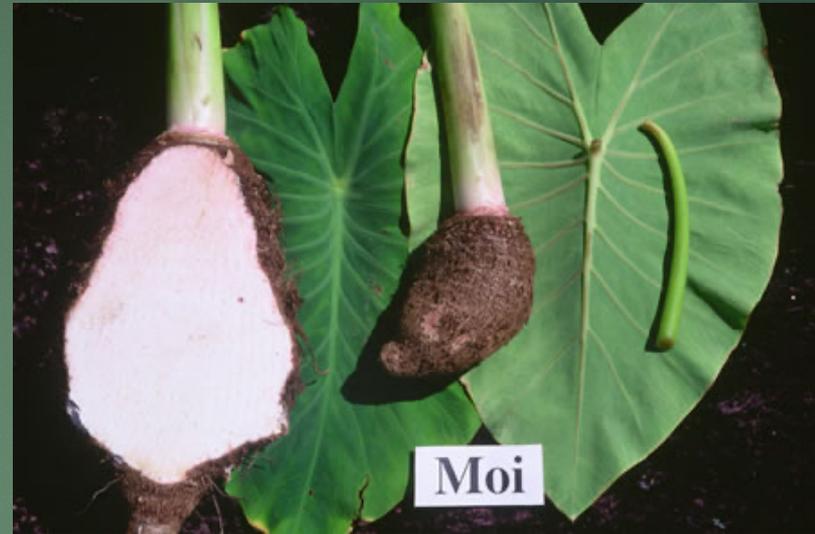


# *Colocasia* (Kalo)- Uses

- ▶ Leaves, stems, and corms all edible, but contain calcium oxalate crystals, so needs to be cooked properly



# *Colocasia* (Kalo)- Selected Cultivars



# Feeding your Plants- Fertilizers

- ▶ N-P-K are most important macronutrients
- ▶ Water soluble versus granular versus polymer coated
- ▶ Organic versus synthetic



# Controlling Pests and Diseases

- ▶ Read the label!
  - ▶ Signal words- Caution, Warning, Danger
  - ▶ Active Ingredient
  - ▶ Environmental hazards
- ▶ Protect yourself- wear PPE
  - ▶ Respirator, goggles, long sleeve shirt and pants, shoes, & gloves
- ▶ Know how and when to apply pesticides
  - ▶ Never apply oil-based products when hot and sunny
  - ▶ Never apply systemic insecticides to flowering plants
  - ▶ Never spray pesticides when windy

**PRECAUTIONARY STATEMENTS**  
**Hazards to Humans (and Domestic Animals)**  
 May be fatal if swallowed. Harmful if inhaled or absorbed. Causes moderate eye irritation. Avoid breathing vapor. Avoid contact with skin, eyes or clothing.

**Personal Protective Equipment:**  
 Applicators and other handlers (other than mixers and loaders):

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

**Mixers and Loaders must wear:**

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks
- Protective eyewear



**DIRECTIONS FOR USE**  
 It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
 For best results, read and follow all label directions.

**BEFORE YOU USE**

- Do not apply near lakes, streams, rivers, or ponds.
- Do not apply to plants grown for food.
- Food utensils such as measuring spoons and measuring cups must not be used for food purposes after use with fungicides.
- Move indoor houseplants outside before treating.

**HOW TO USE Shake Well Before Use**

- Determine how much spray solution to make up - See "How Much to Use".
- Make up spray solution by following directions specific to your sprayer - See "Sprayer Types".
- Wet all plant surfaces until evenly coated with spray, but not dripping.

**HOW MUCH TO USE**  
 Add 1/4 fl. oz. (1 1/2 TBS) to 1 gallon of water

**SPRAYER TYPES**

**PUMP STYLE SPRAYERS**

1. Add the appropriate amounts of concentrate and water to the sprayer tank.
2. Close sprayer, shake well and pressurize.
3. Adjust nozzle to a coarse spray pattern and apply.
4. Occasionally re-pressurize the sprayer if needed to maintain a good spray pattern.

**DIAL-STYLE HOSE-END SPRAYERS**

1. Fill sprayer jar with enough concentrate for the area to be treated. DO NOT ADD WATER.
2. Close sprayer and set dial as recommended below:
  - Ortho Dial 'N' Spray Setting: 1 TBS
  - Chameleon Hose-End Sprayer Setting: 1 TSP
3. Hook to garden hose and apply. To avoid contact with the treated area, begin by spraying area farthest from faucet walking backwards as you spray.
4. Pour any unused product back into this original container.

**TIP: The numbers on dial indicate amount of concentrate per gallon of spray.**

**CONCENTRATE PLUS WATER HOSE-END SPRAYERS**

1. Pour concentrate into sprayer jar to the required fluid ounce level.
2. Add the appropriate amount of water to the gallons level.
3. Replace sprayer top and shake well.
4. Attach sprayer to hose and apply.

**DIRECTIONS FOR USE (cont'd)**

PLANTS	CONTROLS PLANT DISEASES	WHEN TO APPLY	
		To Prevent Diseases	To Treat Existing Disease
Roses	Black Spot Powdery Mildew Rust	Apply every 14 days during the growing season, starting when leaves first appear.	
Flowers	Leaf Spot Powdery Mildew Rust Southern Blight	Apply no more than 3 times per year, 14 days apart, beginning with Spring bud break. Single application rate is 0.0014 lb a.i./gal.	Apply every 14 days for a total of 3 applications beginning at the first sign of disease. Single application rate is 0.0014 lb a.i./gal.
Crabapples (Ornamental), Dogwoods and Other Landscape (Ornamental) Trees	Anthraxnose Leaf Spot Powdery Mildew Rust Scab		
Azaleas, Camellias, Rhododendrons and Other Landscape (Ornamental) Shrubs	Anthraxnose Black Spot Leaf Spot Petals Blight Powdery Mildew	Petal Blight - Apply 2-3 times per week into the flowers as they open and develop color.	
Ground Covers and Vines	Rust Southern Blight		
Houseplants	Leaf Spot Powdery Mildew	Apply no more than 3 times per year, 14 days apart.	
Boxwood	Boxwood Blight	Apply this product 3 times at 14 day intervals when conditions are conducive to disease development (64 - 80°F, high humidity/rain (overhead irrigation). Single application rate is 0.0014 lb a.i./gal.	Contact your local Extension Office for disease confirmation and if positive, destroy the infected plants in a manner that will minimize exposure to other boxwoods.

# Hands On Demonstrations

- ▶ Station 1- Hibiscus cuttings & seeds
- ▶ Station 2- Anthurium potting techniques
- ▶ Station 3- Hedychium rhizome propagation
- ▶ Station 4- Kalo huli and TC plant potting
- ▶ Split into groups of four, 10 min. @ each station
- ▶ Finish off workshop w/short hike



# Lyon Holiday Plant & Craft Sale

Friday, Dec. 2<sup>nd</sup> – Saturday Dec. 3<sup>rd</sup>

- ▶ Registration required for attendance
  - ▶ Link on Lyon Website to Eventbrite in early November
  - ▶ FLA members get opportunity for early registration



Mahalo for you interest in plants!  
Any questions?

