

Sending Pest-Free Products to California

Maui Flower Growers' Association

Hana, Maui, Hawaii

November 3, 2012

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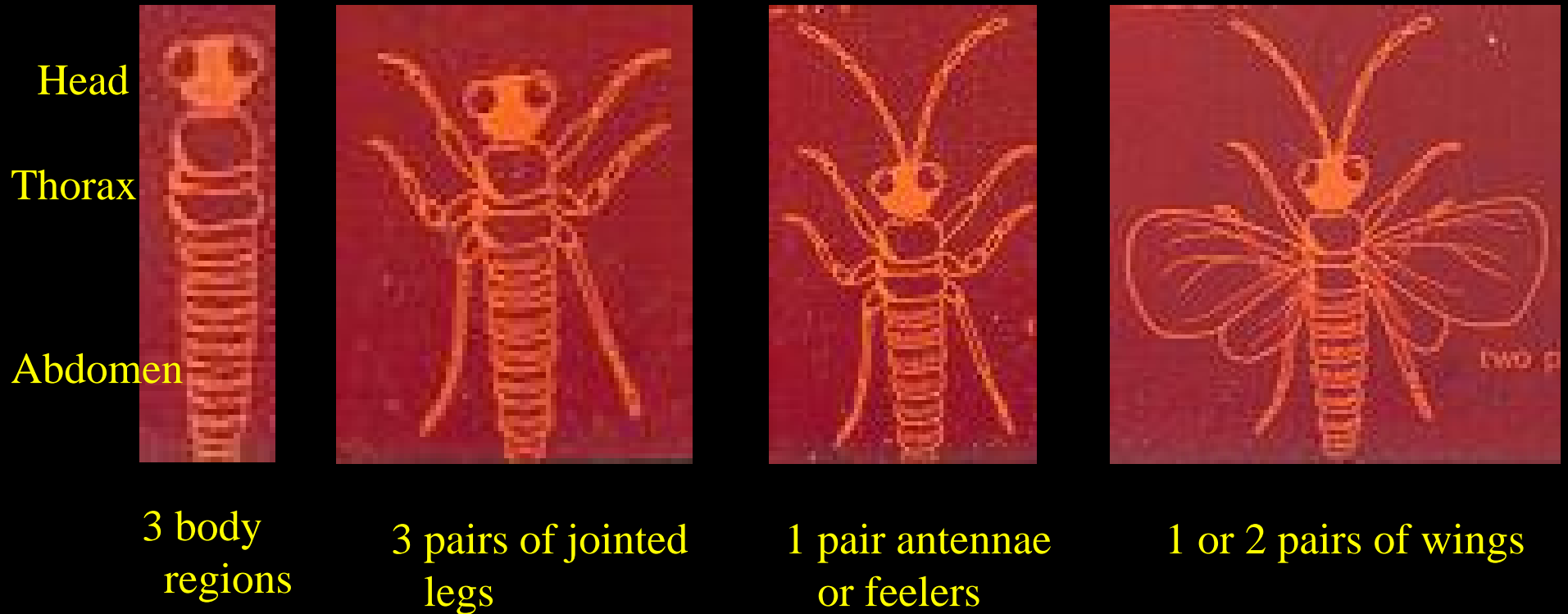
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Topics to Be Covered

- Basic Entomology
 - Why so many invasive pests? What is an insect?
 - Major types of development
 - Types of mouthparts
- California and Hawaii Quarantine Regulations
- Recent Rejections of Hawaiian Shipments
- Major Quarantine Pests and Control Strategies
 - Armored Scales
 - Mealybugs
 - Ants
 - Whiteflies
- Systems Approach to Assure Pest-Free Shipments
- Field Control Tactics
- Postharvest Disinfestation Treatments

What is an Insect?



*Hard exoskeleton requiring molting for growth.

*Open circulatory system (no blood vessels).

*Highly adaptable to the environment (land, water, air).

*Accounts for 90% of known animals w/ 10+ million species.

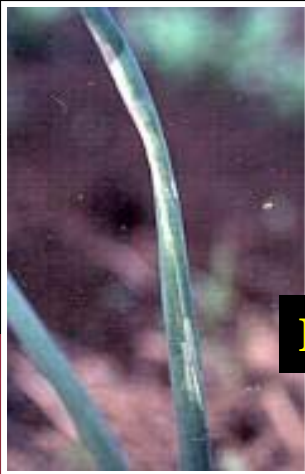
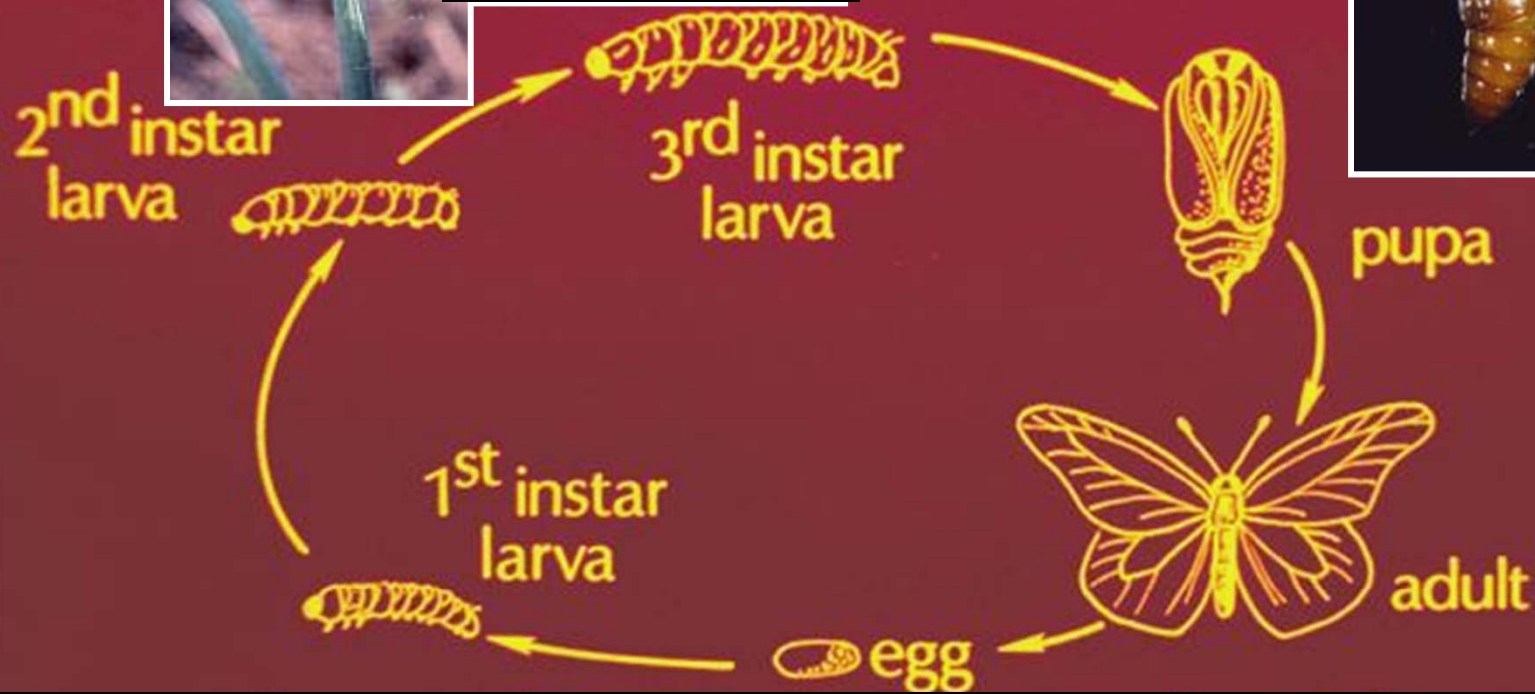
Two Major Types of Insect Development

- I. Complete Metamorphosis
- II. Gradual Metamorphosis

Complete Metamorphosis

Beet
armyworm

Inside green onion



Major Cause of Shipment Rejection

Green Garden Looper

Complete Metamorphosis

Chewing mouthparts (caterpillars)

Younger instars



Older instar



Pupa in silken cocoon



Adult



Insects with Complete Metamorphosis

- * Butterflies, Moths

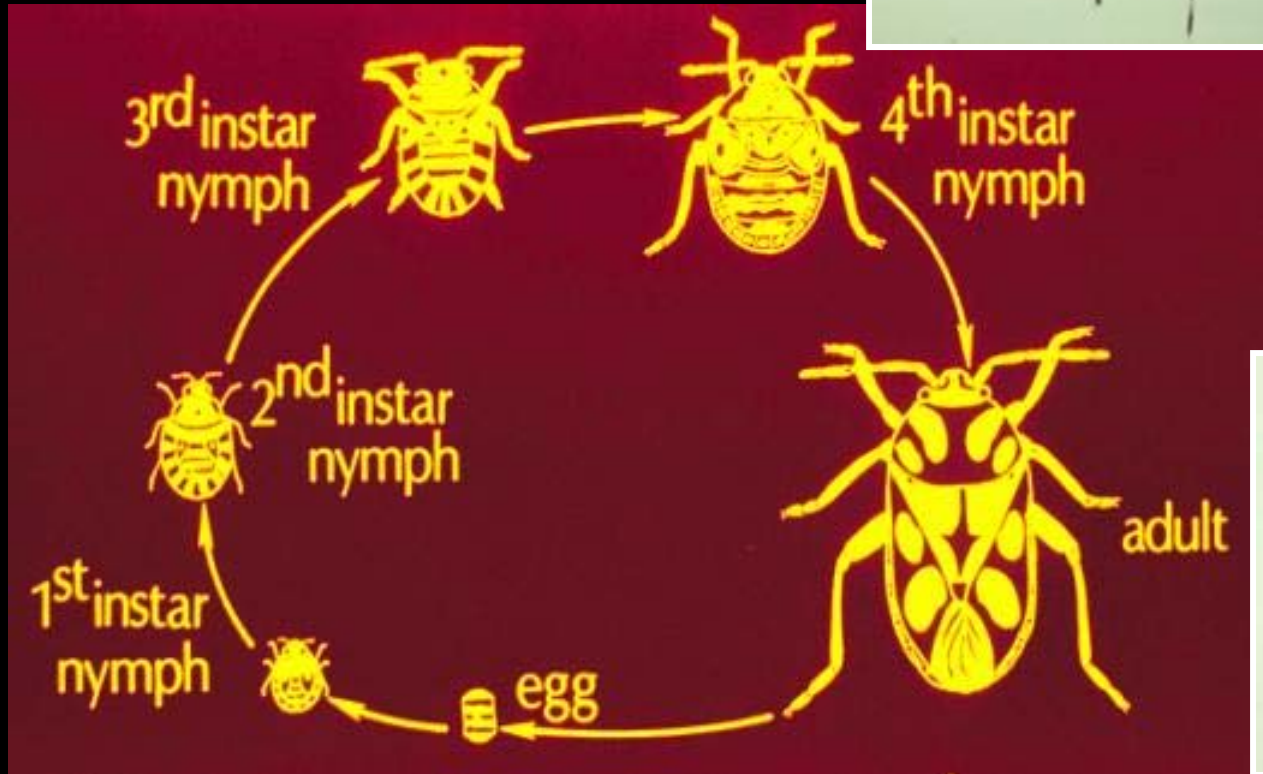
- * Flies

- * Bees and Wasps

- * Beetles

Gradual Metamorphosis

Stink bug

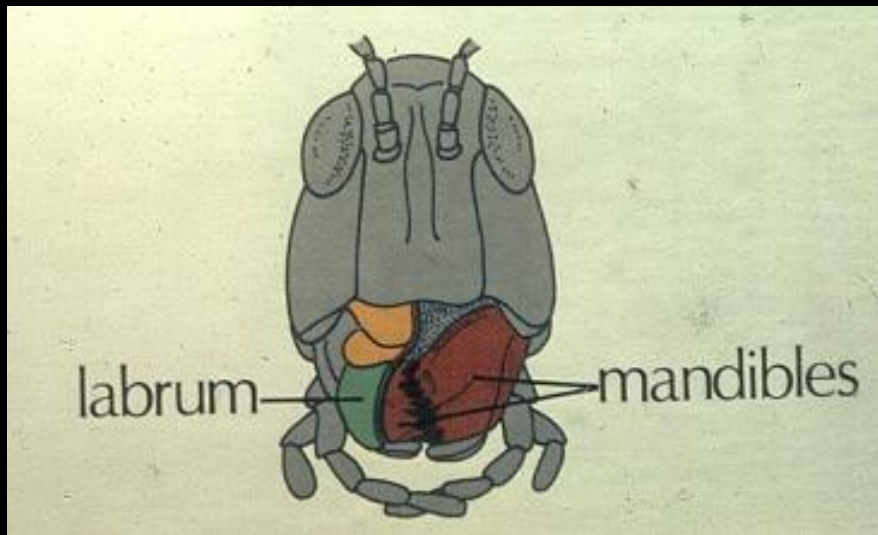


Insects with Gradual Metamorphosis

- * Cockroaches, Grasshoppers, Crickets
- * True Bugs (lacebugs, stinkbugs)
- * Aphids, Mealybugs, Scales, Whiteflies

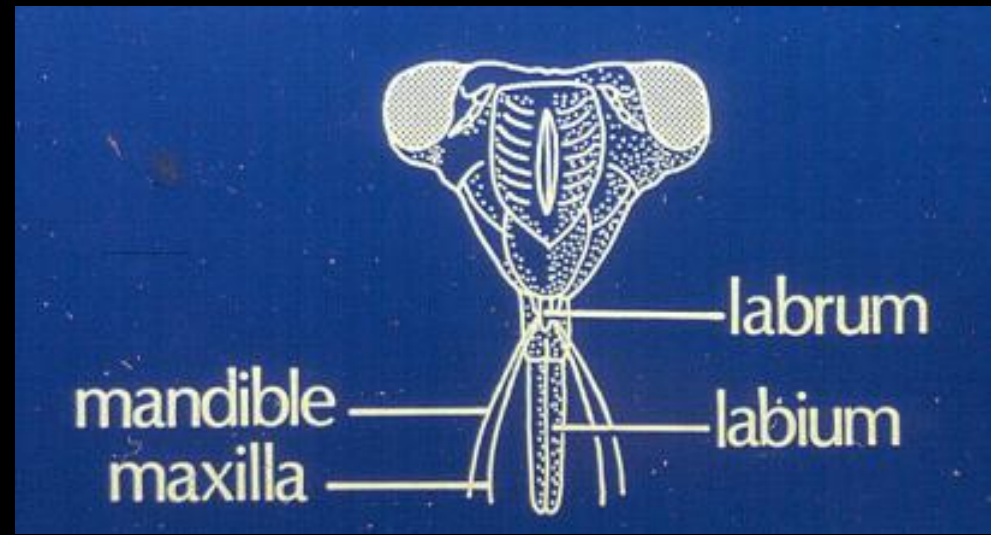
Two Major Types of Mouthparts

Chewing Mouthparts



Mandibles are like teeth for chewing.

Sucking Mouthparts



Mouthparts modified to function like an hypodermic needle for sucking plant juices or blood.

Examples of Insects with Chewing Mouthparts

Leaf-cutting Bee
(*Megachile* sp.)



<http://www.honolulurosesociety.org/pests.html>



Chinese Rose Beetle



Walking stick

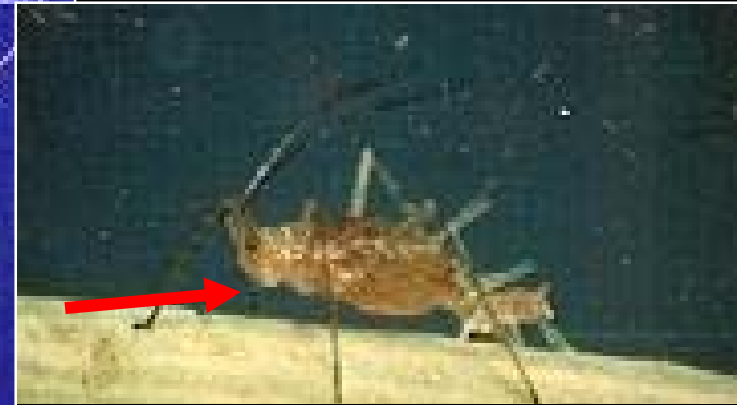
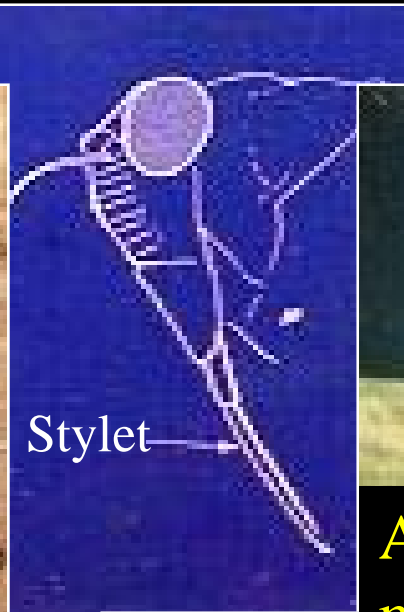
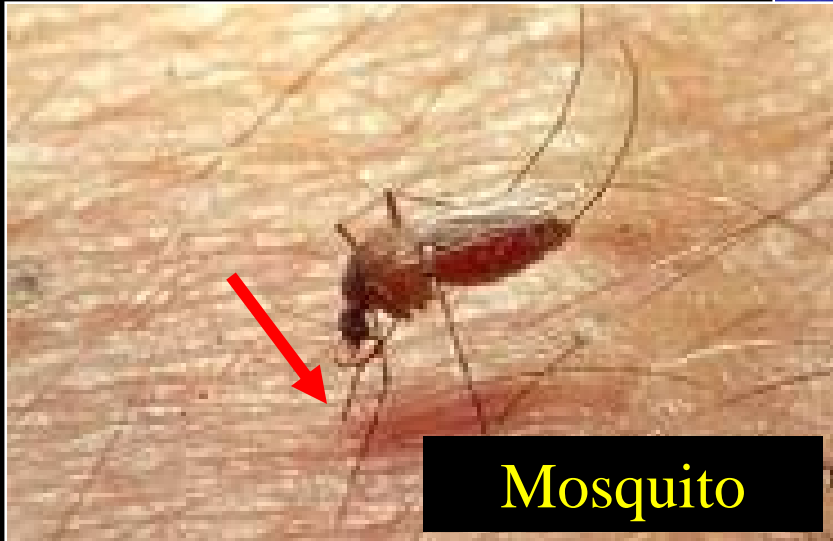
Katydid



Fuller Rose Beetle



Examples of Insects with Sucking Mouthparts



Aphids, also scale insects, mealybugs, whiteflies, leafhopper, planthoppers



Stink bug feeding damage to macadamia

Regulation of Import & Export of Agricultural Products in Hawaii

Exports from Hawaii

Hawaii Department of Agriculture (HDOA) regulates the export of nursery products (propagative plants) to the mainland U.S.

U.S. Department of Agriculture (USDA) regulates the export of cut-flowers, foliage and fruits from Hawaii to the mainland U.S., and plant products to foreign countries.

Imports to Hawaii

HDOA regulates all imports from the U.S. Mainland. Agricultural items brought into the Hawaii by passengers and importers must declare all agricultural items and may be subject to inspection, including baggage, cargo and mail.

The **U.S. Customs and Border Protection Agency** and **USDA** regulate the introduction of plant products, from **foreign countries** into Hawaii. Sometimes, the State may have additional restrictions on the same commodity. These commodities must be inspected by both agencies to insure all the requirements are met. (e.g., orchids)..

**Interisland Movement of Agricultural Products
is Regulated by HDOA**

Welcome to PHPPS.CDFA.CA.GOV (secured site)
Plant Health and Pest Prevention Services
Interior Pest Exclusion Program

High Risk Pest Exclusion Reports

- [Foreign Plant Shipments](#)
- [Hawaii](#)
- [Florida](#)
- [Monthly High Risk Interception Reports](#)
- [Monthly Nematodes Sample Results](#)
- [Parcel Facility Locations](#)
- [Suspended Out of State Shippers](#)
- [Weekly A and Q Report](#)



Hawaii Reports

[A, B, Q Reports](#)

[Approved Nursery Stock Shippers](#) (QC
650)

[Weekly A and Q Interceptions Report on
Fruits and Vegetables](#)

A/Q-Rated Pest Interceptions with Determinations Entered
August 16, 2012 through August 22, 2012
Grouped by PDR Activity

Date Determined	Rating	Location or County	Dead or Alive	Common Name	Scientific Name (or Family)	PDR Number	Host	Owner	Shipper Name/State
Exclusion & Detection									
Quarantine - State Exterior (01)									
8/22/2012	Q	Truckee		Armored Scale	Aonidiella sp.	TR0P06025566	com		
8/22/2012	A	San Diego	L	Magnolia White Scale	Pseudaulacaspis cockerelli	1426822	phoenix roebellenii	Palm Acres, Inc.	Westwind Nursery FL
8/22/2012	Q	Yermo	L		Cerambycidae	YE0P06027252	Ponderosa Pine		
8/22/2012	Q	Needles	L		THRIPIIDAE	NE0P06017692	peach		
8/22/2012	A	Topaz	L	Western Cherry Fruit	Rhagoletis indifferens	5081616	cherry		
8/22/2012	Q	San Mateo	L		PSEUDOCOCCIDAE	410P06095501	chrysalidocarpus lutescen	San Francisco Florist	Cal Air Cargo for Cost CA
8/22/2012	A	San Mateo	L	Boxwood Scale	Pinnaspis buxi	410P06095500	chrysalidocarpus lutescen	San Francisco Florist	Cal Air Cargo for Cost CA
8/22/2012	Q	San Mateo	L	Insect egg		410P06095499	chrysalidocarpus lutescen	San Francisco Florist	Cal Air Cargo for Cost CA
8/22/2012	Q	Fresno		Ant	Technomyrmex albipes	1561463		Flowers and more by 3	Costa Rica and HI
8/21/2012	Q	Los Angeles	L		PSEUDOCOCCIDAE	190P06058450	Chamaedorea Leilani	Costa Rica Nursery	Costa Rica and HI
8/21/2012	A	Los Angeles	L	Lesser Snow Scale	Pinnaspis strachani	190P06058450	Chamaedorea Leilani	Costa Rica Nursery	Costa Rica and HI
8/21/2012	Q	Los Angeles	L	Mealybug	Nipaecoccus sp.	190P06058450	Chamaedorea Leilani	Costa Rica Nursery	Costa Rica and HI
8/21/2012	Q	Needles	L		APHIDIDAE	NE0P06017680	oak		
8/21/2012	Q	San Diego			indet.	1508900	Unknown	Rainbow Tropicals	Naugle's Nursery FL
8/20/2012	Q	Los Angeles	L	Ant	Technomyrmex albipes	190P06058449	Cut Flowers	Maui & Co. Garden	Maui HI
8/17/2012	Q	Los Angeles	L	Margarodid Scale	Icerya sp.	190P06058445	Cut Flowers	Maui & Co. Garden	Maui HI
8/17/2012	Q	San Bernardino	L		PSEUDOCOCCIDAE	1630590	dracena sp	Maui & Co. Garden	Tropical Flowers Exp HI
8/17/2012	A	Santa Clara		Sansevieria Scale	Parlatoria proteus	1626363		Milady Weisenstein	Oneida Ferrer FL
8/16/2012	Q	Fresno			VERONICELLIDAE	1561462	Ti Leaves	Lou Gentile's Flower Ba	International Orchid CA
8/16/2012	Q	Los Angeles	L	Carpenter Ant	Camponotus sp.	190P06058444	Longan	Lo's Nursery	Mr. Sushi Express FL
8/16/2012	Q	Los Angeles	L	Carpenter Ant	Camponotus sp.	190P06058444	Longan	Lo's Nursery	Mr. Sushi Express FL
8/16/2012	Q	Los Angeles	L		Delottococcus confusus	190P06058445	Cut Flowers	Maui & Co. Garden	Maui HI
Quarantine - State Interior (02)									
8/20/2012	A	Alameda		Light Brown Apple Mo	Epiphyas postvittana	1592205	olea sp.	Regan's Roses	
Quarantine - Federal Domestic (03)									
8/21/2012	A	Alameda	D	Japanese Beetle	Popillia japonica	SJ0P06002973		United Parcel Service	
8/20/2012	A	Alameda	L	Magnolia White Scale	Pseudaulacaspis cockerelli	1646960	Mixed leis	Maui & Co. Garden	Maui HI
Quarantine - Agricultural Code (06)									
8/22/2012	Q	Truckee	L		PSEUDOCOCCIDAE	TR0P06025565	orange		
8/22/2012	A	Vidal	L	Quagga Mussel	Dreissena rostriformis bugen	VI0P06026779	boat	Vanderhoof, Brian	Vanderhoof, Brian CA
8/22/2012	Q	Tulelake		Mango Scale	Radionaspis indica	TU0P0602567	mango		
8/22/2012	A	Tulelake		Vanda Orchid Scale	Parlatoria pseudaspidotus	TU0P0602567	mango		
8/22/2012	A	Tulelake	L	Vanda Orchid Scale	Parlatoria pseudaspidotus	TU0P0602567	mango		
8/22/2012	A	Tulelake		Vanda Orchid Scale	Parlatoria pseudaspidotus	TU0P0602567	mango		

CDFA Pest and Damage Report 1982 - 10/2008

Pest

Bigheaded Ant	1785
Spiraling Whitefly	1350
Leafhopper	553
Other Ant Species	535
Slug <i>Veronicella</i> sp.	358
Green Garden Looper	304
Croton Whitefly	202
Mealybug	187
Seed Bug	186
Green Scale	160
Whitefly	154
Snail	150
Torpedo Bug	143
(blank)	135
Club Moss Mealybug	120
Longhorned Beetle	111
Red Wax Scale	109
Inornate Scale	103

Host

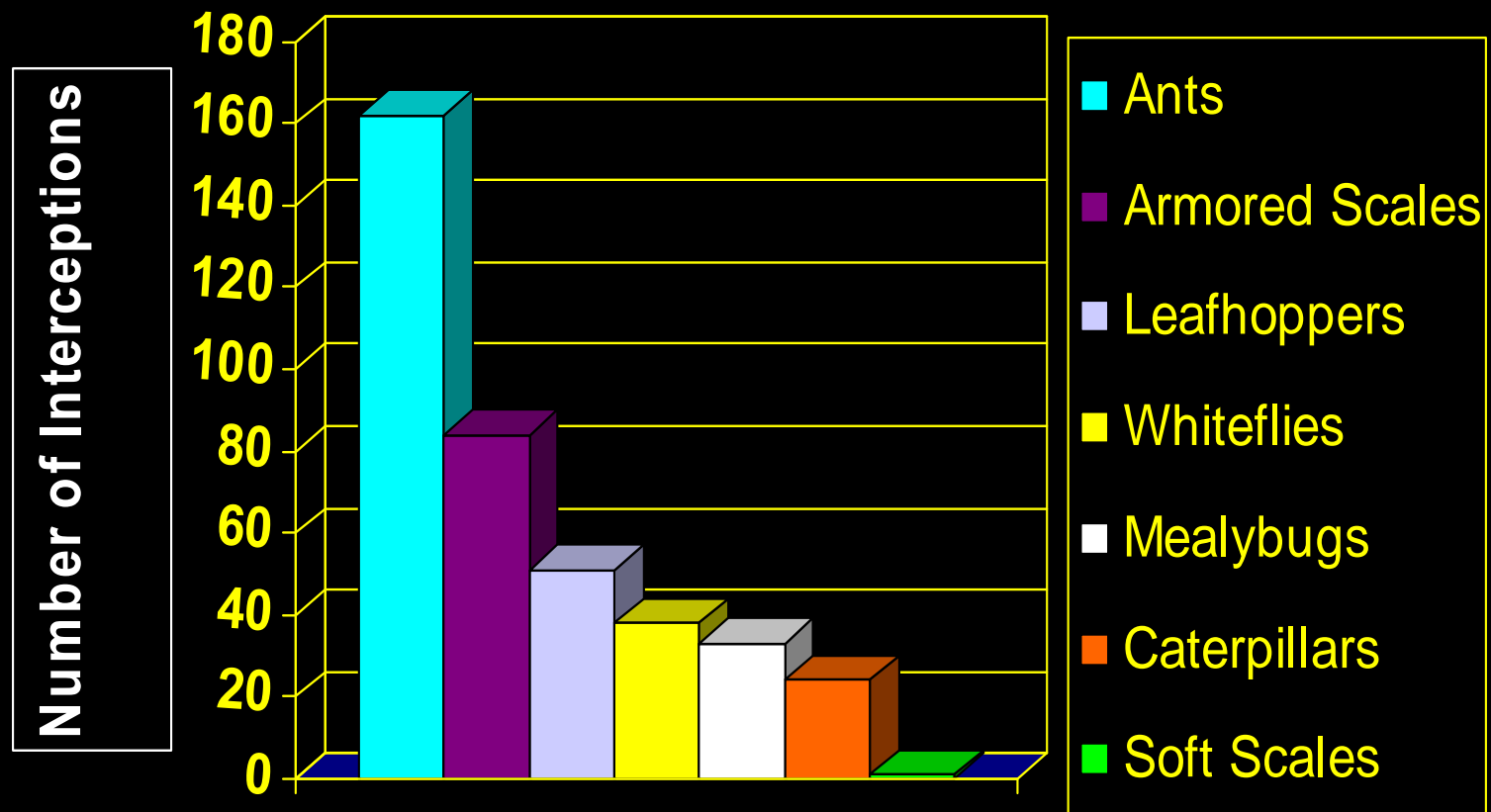
Basil	720
Floral Ginger	541
Malungai	527
Betel Leaf	489
Cut Flowers	429
<i>Protea</i> sp.	359
Pineapple	319
<i>Cordyline</i> sp.	275
Automobile	250

(USDA APHIS, CDFA)

Pests Commonly Rejected in Hawaiian Shipments

October 2008 to February 2009

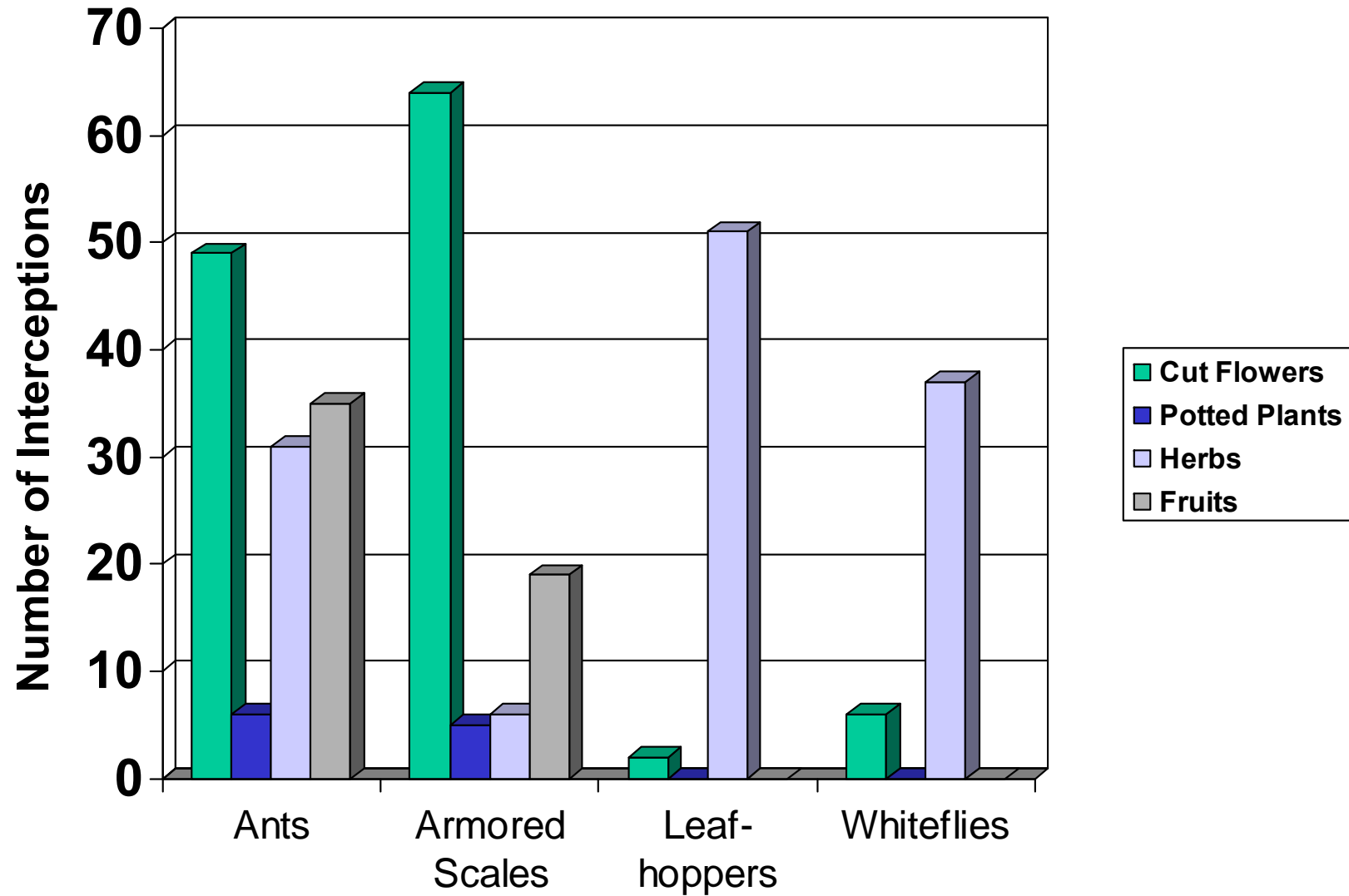
SUMMARY OF ALIEN INSECT SPECIES BY ORDER (1981 TO 2002)



(USDA APHIS, CDFA 2009)

Quarantine Pests Intercepted on Hawaiian Shipments

October 1, 2008 to February 28, 2009



FedEx Distribution Center Near San Francisco Airport, San Mateo County



Roses from South America considered low risk



Flowers from HI considered high risk

Inspection at FEDEX Distribution Center in Oakland

With Ken Peek, Senior Agricultural Biologist, **December 21, 2010**





2010/12/21



2010/12/21



2010/12/21



2010/12/21

Summary of package holding requirements for Agriculture

- Packages containing unprocessed agricultural commodities must be held for inspection, including California origin packages, unless they bear:
 - A green and white "Passed California Agriculture" sticker



or,

- A certificate or permit with the following text:

"THIS SHIPMENT NEED NOT BE HELD FOR INSPECTION IN CALIFORNIA"

*****If this text does not appear, the box must be held for inspection*****

Examples of Certificates:

CALIFORNIA
APPROVAL FOR RELEASE
OF INTRASTATE SHIPMENTS
NO. _____

This shipment has passed quarantine inspection upon entry into California or at the shipping origin within California and meets all California quarantine requirements.

THIS SHIPMENT NEED NOT BE HELD FOR INSPECTION IN CALIFORNIA

Issued by: _____
and California Department of Food and Agriculture
1220 N Street, Sacramento, CA 95814

CALIFORNIA/_____
ORIGIN INSPECTION CERTIFICATE
FOR INTERSTATE SHIPMENTS
NO. _____

This plant material or nursery or premises from which this shipment was made has been inspected and found free from especially injurious plant pests and disease symptoms.

THIS SHIPMENT NEED NOT BE HELD FOR INSPECTION IN CALIFORNIA

Issued by: _____
and California Department of Food and Agriculture
1220 N Street, Sacramento, CA 95814

CALIFORNIA NURSERY STOCK
CERTIFICATE FOR
INTERSTATE AND INTRASTATE SHIPMENTS
NO. _____

This plant material or nursery or premises from which this shipment was made has been inspected and found free from especially injurious plant pests and disease symptoms.

THIS SHIPMENT NEED NOT BE HELD FOR INSPECTION IN CALIFORNIA

Issued by: _____
and California Department of Food and Agriculture
1220 N Street, Sacramento, CA 95814

2010/12/23



CALIFORNIA DEPARTMENT OF
FOOD & AGRICULTURE

Karen Ross, Secretary

DATE: July 24, 2012
TO: All County Agricultural Commissioners
FROM: Plant Health and Pest Prevention Services
SUBJECT: **A and Q Pest Report No. 28-2012**
Weekly A and Q Report: For the week of July 5-11, 2012

Attached is the report for all A and Q pests intercepted or detected in California from July 5-11, 2012. Pests are identified by the California Department of Food and Agriculture's Plant Pest Diagnostics Laboratory.

Fresno Dog Team Interception

PDR: 1626935

On Thursday, July 5, 2012, Fresno dog team handler Stephanie LeBarron, dog Chelsea, and Inspector Aide Matthew Douglas were inspecting packages at FedEx in Fresno. Chelsea alerted on a package sent from Allegiant Air in Las Vegas, Nevada. Upon opening, the team discovered ti leaf garland with egg masses on the leaves.

On June 30, 2012, Allegiant Air began flying from Fresno to Hawaii. The first return flight from Hawaii to Fresno was scheduled for July 6, 2012. Phone conversations with Allegiant Air determined that the garland had originated in Hawaii and was being sent to Fresno Air terminal for good luck on the inaugural Hawaiian flight into Fresno. A sample submitted to the lab came back with a determination of live Q-rated *Orchamoplatus mammaeferus* (croton whitefly) pupae. The ti leaf garland was double bagged and destroyed.



Fresno Dog Team pictured with infested ti leaves from Hawaii

Rejected for maile (maire), NOT ti-leaf, imported from Cook Islands to Hawaii

Major Cause of Shipment Rejections

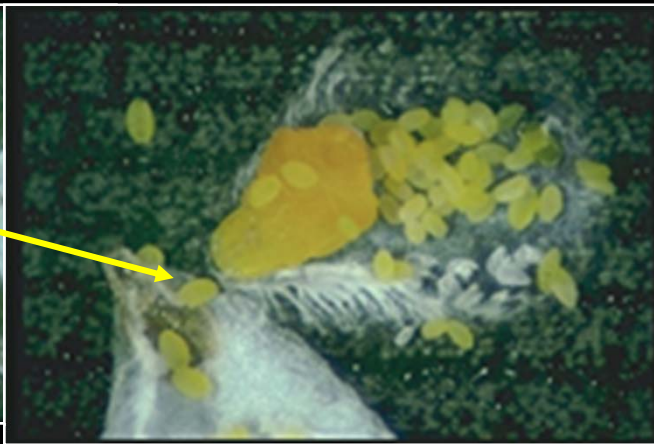
Scale Insects

Armored

Soft



Cockerell
or Magnolia
White Scale



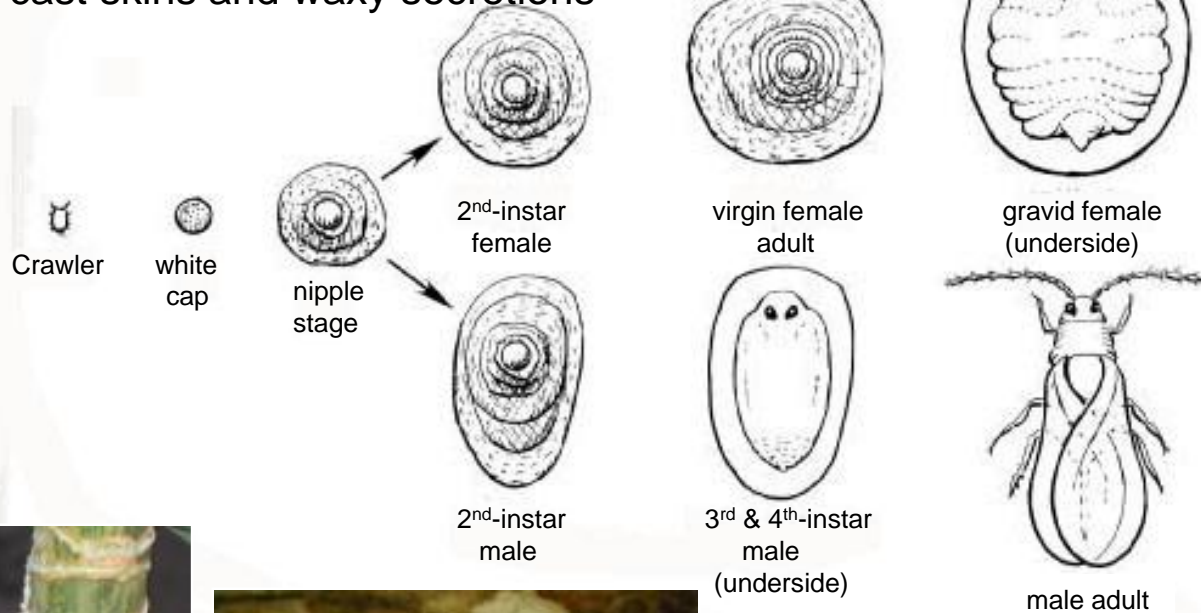
Green scale



Development of Armored Scales

Crawler to adult is about one month

Armored covering formed by
cast skins and waxy secretions

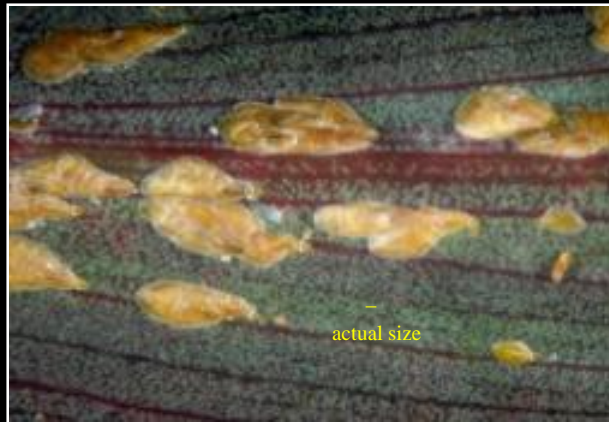


Armored Scales Causing Rejections

Coconut Scale



Ti Scale



Black Thread Scale



Saprophytic fungus,
Sphaerobolus stellatus



Cycad Scale



Mining Scale



Soft Scales Causing Rejections

Hemispherical Scale



Wax Scale



Green Scale



Nigra Scale



Major Cause of Shipment Rejections

Mealybugs

Foliar

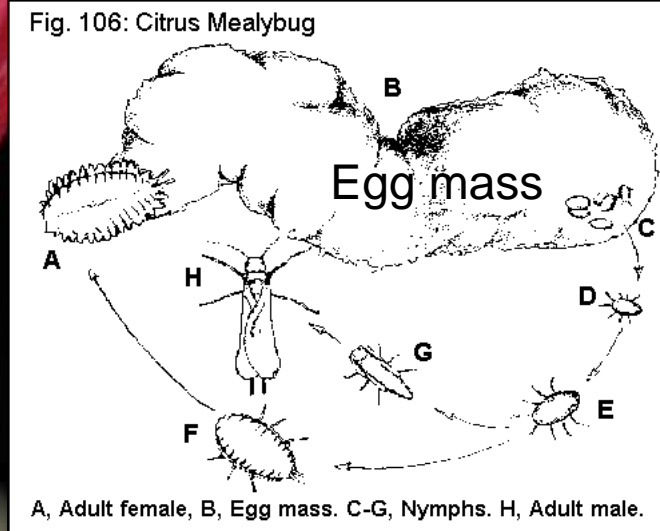


Root



Mealybugs Causing Rejections

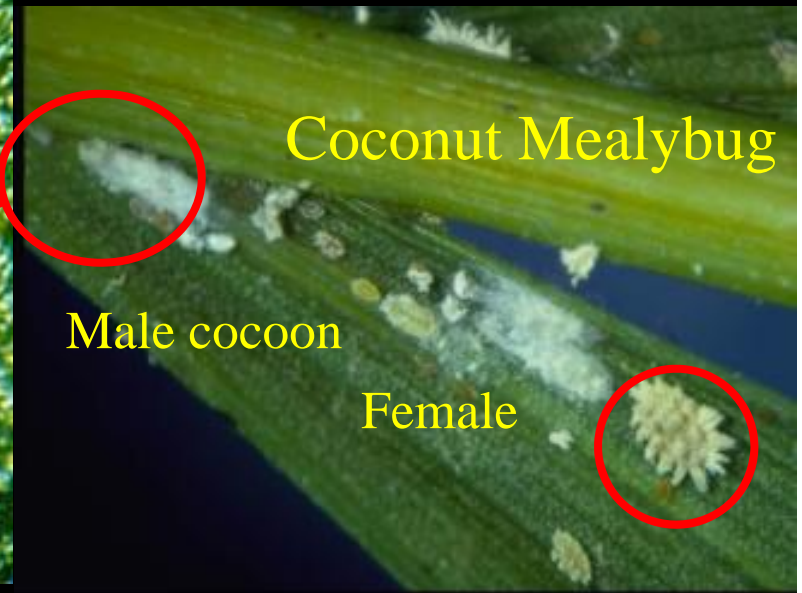
Citrus Mealybug



Eggs per adult = 200-400



Egg to egg-laying adult
= 20-44 days
Female adult life span
= 90 days

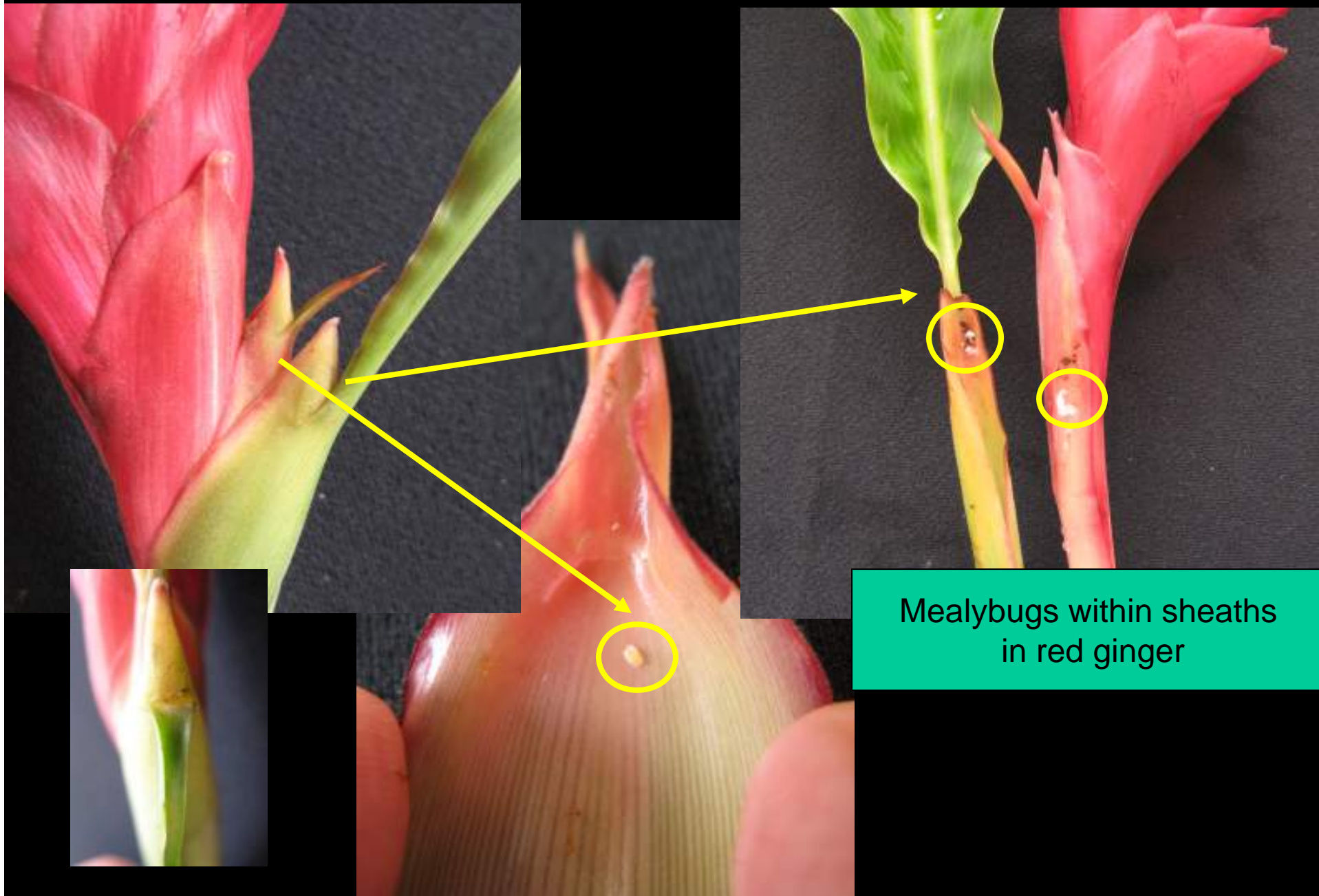


Coconut Mealybug

Male cocoon

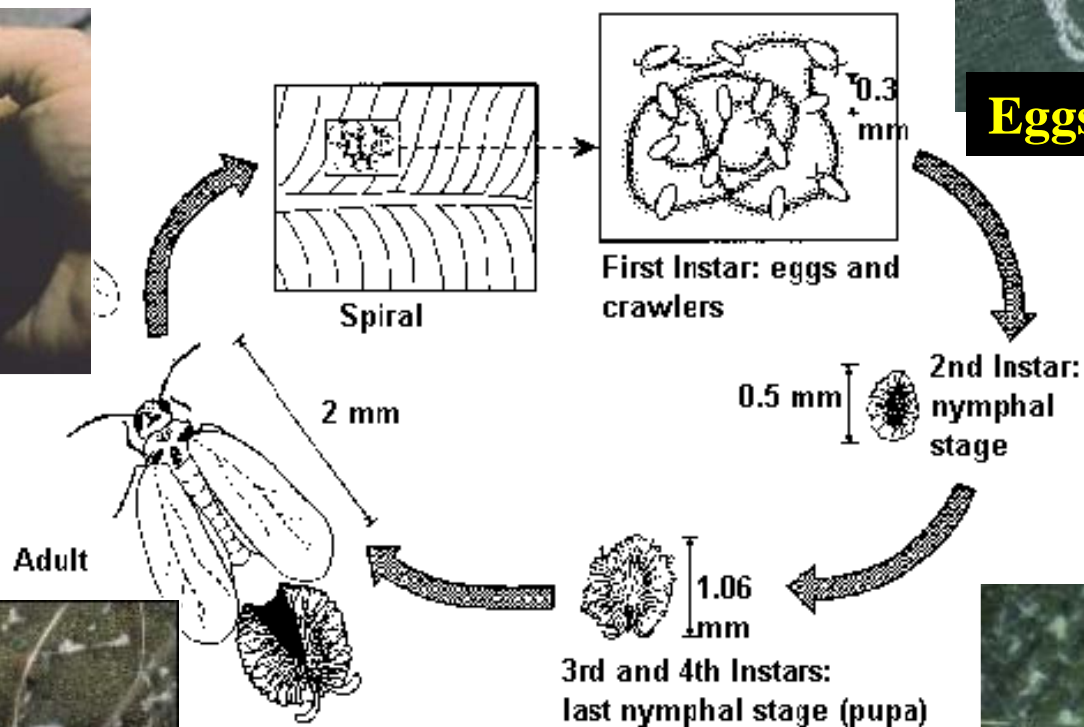
Female

Infestations in Developing Bracts & Sheaths



Major Cause of Shipment Rejections

Whiteflies



Eggs laid in spiral



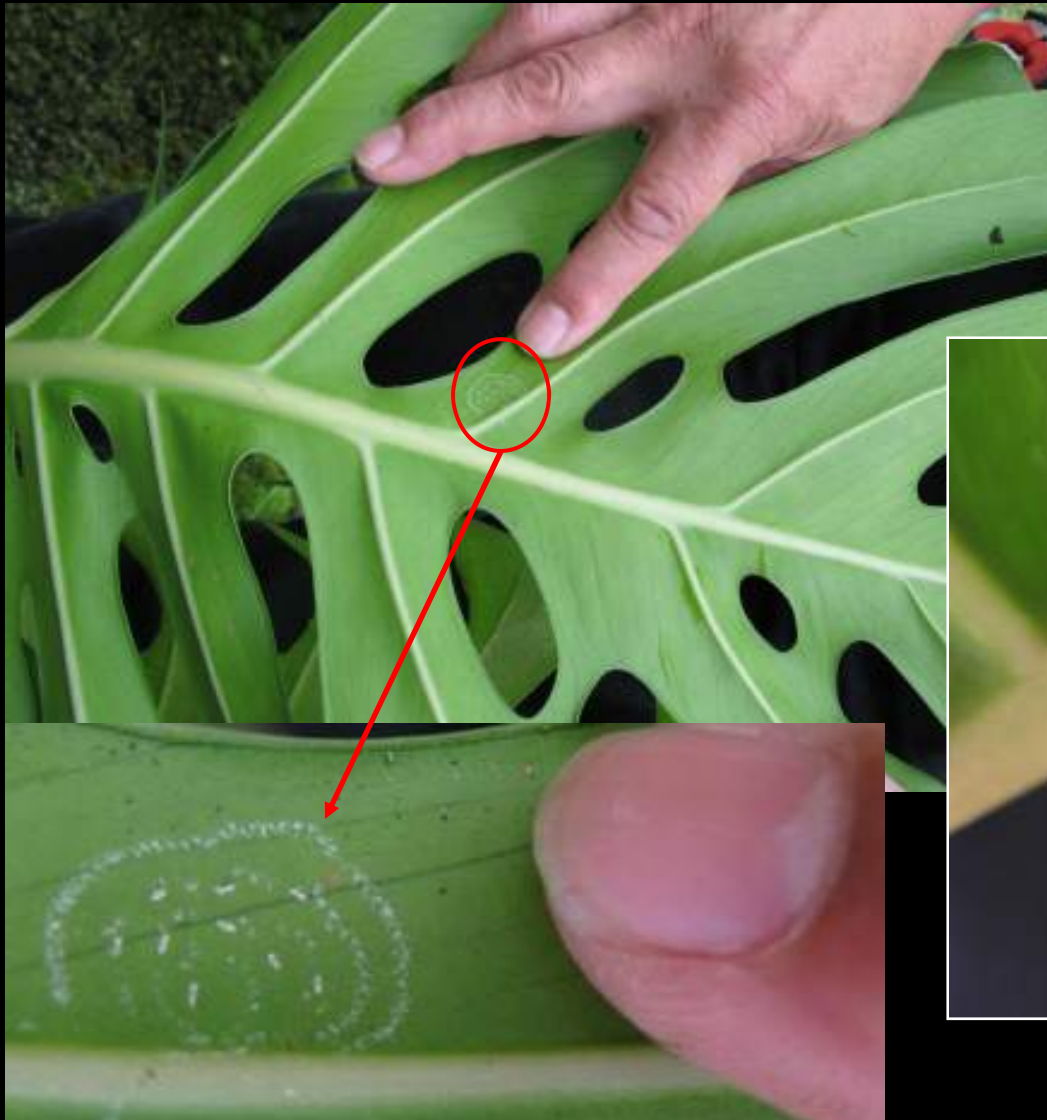
Pupal stage

**Egg to adult
<3 weeks**



Nymphal stage

Major Cause of Whitefly Rejection = Spiraling Whitefly Eggs



Stem end of monstera leaf
("ruffle") for scale and
mealybug infestation

Sooty Mold

Sooty mold is caused by a sweet substance called honeydew excreted by aphids, mealybugs, soft scales and whiteflies. Plants with sooty mold indicate severe infestations of one of the above insects.



Ants Increase Aphid, Mealybug, Soft Scale, and Whitefly Infestations

Ants feed on sweet honeydew excreted by aphids, mealybugs, soft scales and whiteflies. Ants nurture these pests by protecting them from predators and “cleaning house”. Controlling ants will reduce these pests.



Major Cause of Shipment Rejections

ONE WORKER ANT

Longlegged ant
Anoplolepis gracilipes



Bigheaded ant
Pheidole megacephala



Tiny yellow house ant
Tapinoma melanocephalum



Whitefooted ant
Technomyrmex albipes

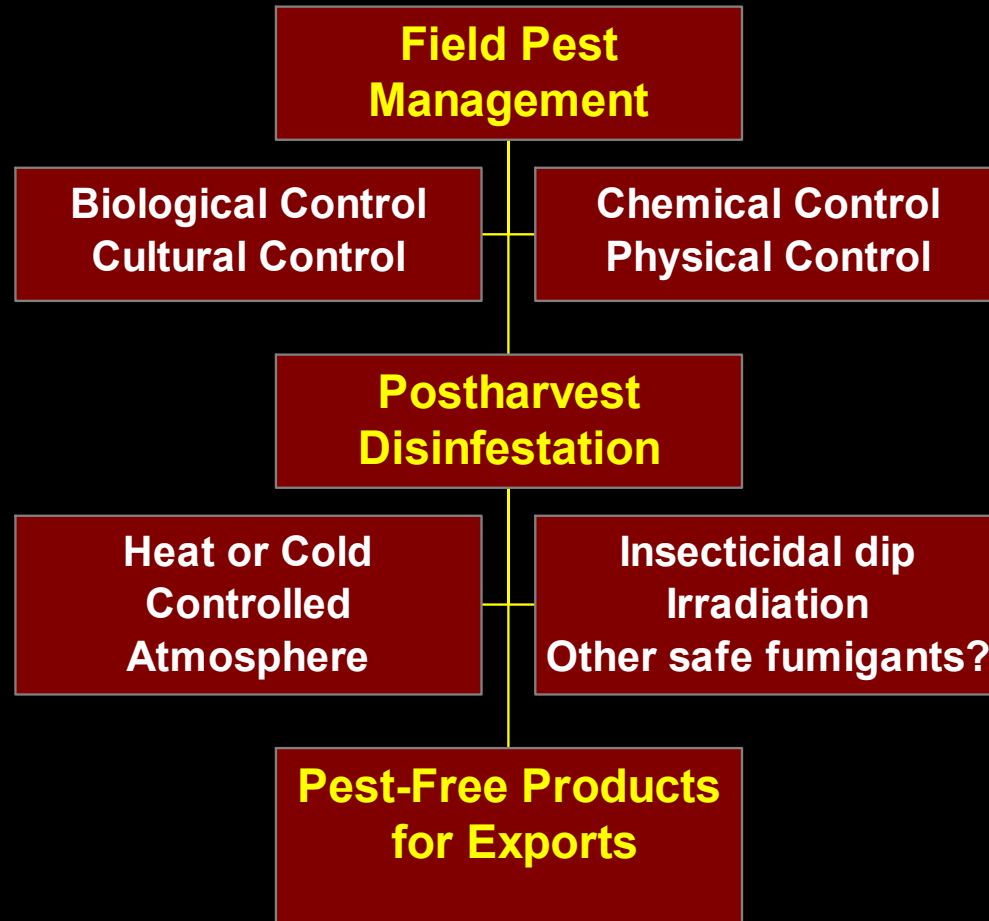


Little fire ant
Wasmannia auropunctata



Break!

Systems Approach to Quarantine Security



Field Control Tactics

- ▶ **Cultural Control** - Sanitation by removal of plant parts or plant. Grow healthy plants. Stressed plants are more susceptible to pests.
 - ▶ **Physical Control** - temperature, water.
 - ▶ **Mechanical Control** - fly swatter, screening
 - ▶ **Biological Control** - use of parasites, predators, or pathogens (fungus, bacteria, virus, nematode).
 - ▶ **Biorational Control** - soaps, oil, insect growth regulators, softer/natural insecticides-neem, pyrethrins, rotenone.
 - ▶ **Chemical Control** - Malathion, Diazinon, Dursban (OP) and Sevin (carbamate)
- Reduced-Risk Insecticides:** Insect Growth Regulators-Talus, Distance; systemic neonicotinoids-Marathon, Safari

Cultural Control against Coqui Frogs

Habitat modification

Remove nesting and retreat sites

Lava Tree State Park

Before



During



After



Inmates from Hawaii Community
Correction Center provided labor.

Mechanical Exclusion = Screening



Coqui Frog Fence Barrier



Red ginger in woven bags



Papaya plants with plastic barrier



Papaya screen house in Taiwan

Biological Control of Aphids. Mealybugs, Scale Insects and Whiteflies

Pathogenic fungus



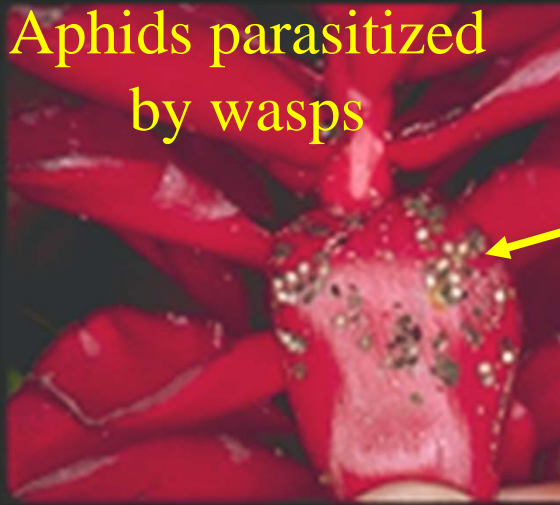
Ladybeetles



Parasitic wasp



Aphids parasitized by wasps



Mummified aphids



Syrphid maggot



Ladybeetles



Lacewing



Pseudoscorpion



Biological Control Strategies for Scales, mealybugs and whiteflies

Pathogenic fungi
and parasitic wasps



Ladybug



Immature ladybugs



Evolution of Insecticides

1940-50's

Chlorinated hydrocarbons

DDT, Chlordane, Dieldrin, Mirex



1960-70's

Organophosphates & Carbamates

Dimethoate, Diazinon, Dursban, Orthene



1980-90's

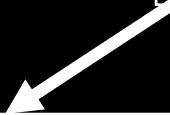
Pyrethroids (synthetic)

Mavrik, Tame, Tempo, Decathlon, Talstar



1990-2000's

Reduced-Risk Insecticides



Naturalytes

Conserve, Avid,
Ultiflora, Neem, Bt

Insect Growth Regulators

Distance, Enstar, Talus

Neonicotinoids

Merit, Marathon,
Safari, TriStar

Insecticide Toxicity to Natural Enemies

Common name (trade name)	Class	Selectivity (affected groups)	Predator Mites	General Predators	Parasites	Duration of impact to natural enemies
carbaryl (Sevin)	carbamate	Broad (insects, mites)	Moderate/ High	High	High	Long
chlorpyrifos (Dursban)	OP	Broad (insects, Mites)	Moderate	High	High	Moderate
fenpropathrin (Tame similar to Talstar)	Pyrethroid	Broad (insects, Mites)	High	High	High	Moderate Long for Talstar
Imidacloprid (Merit as a drench or trunk spray)	Neonico- tinoid	Narrow (sucking, insects)	-	Low	Low	-
Imidacloprid (Merit as a foliar)	Neonico- tinoid	Narrow (sucking, insects)	-	Moderate	High	Short to moderate
Insecticidal Soap (M-Pede)	soap	Broad (insects, Mites)	Moderate	Moderate	Moderate	Short to none

<http://www.ipm.ucdavis.edu/PMG/r302900111.html>

- * **Drench application** must be applied to the feeder roots with adequate soil moisture.
- * Subsequently, the tree must be irrigated to assure uptake.
- * Liquid fertilizer added to insecticide may assist uptake.
- * Competition by groundcovers or turf contributes to effective uptake.



Control of Scale Insects

INSECTICIDE	ARMORED/HARD	SOFT
Oils, horticultural	Effective	Effective
Pyrethroids: Talstar/Decathlon	Not effective	Effective
Neonicotinoids: Merit/Marathon TriStar Safari	Not effective Not effective Effective	Effective Effective Effective
Insect Growth Regulators (IGRs): Distance	Effective	Not effective
Talus	Effective	Effective

White-footed Ant



Bigheaded Ant



Little Fire Ant



- *Bigheaded and LFA are effectively controlled with commercially available red imported fire ant bait insecticides.
- *White-footed ant is very difficult to control because food or bait toxicants ingested by foraging workers are not regurgitated, nor is it shared with others.
- *Sugary liquid bait insecticides with boric acid (Terro) have shown to be effective by killing white-footed ant workers, who feed sterile eggs to the brood and nestmates. Brood and nestmates die by starvation.
- *A highly effective insecticide, fipronil, is slow-acting and eliminates ant nests, but is not registered for use on ornamentals; registered for use only against termites.
- *Pyrethroids such as Talstar or the organophosphate, Dursban, can be effective as a barrier treatment to prevent worker ants from foraging on plants nurturing honeydew-producing insects.



Active Ingredients:

1.00% Hydramethylnon, similar AI to Amdro & Pro bait

Mode of Action: Disrupts energy metabolism.

Maxforce Complete granules contain a bait matrix combining sugars, proteins (including silk worm pupae), fats and oils, which accommodate insects' changing nutritional needs.

Ants (Acrobat, **Argentine**, **Big Headed**, **Carpenter**, Cornfield, Field, imported and native Fire, **Ghost**, Harvester, **Odorous House**, Pavement, **Pharaoh**, Thief)

Maxforce® Complete Brand Granular Insect Bait is a ready-to-use product for use indoors and outdoors and around buildings, on lawn, and other non-crop areas (including school yards, playgrounds, golf courses, and ornamental nurseries).

Biological or Microbial Insecticide

Bacteria - *Bacillus thuringiensis* – caterpillars

B.t. israelensis – mosquitoes, fungus gnats

Fungi - *Paecilomyces fumosoroseus* – whiteflies,
Preferal aphids, thrips, mealybugs

Humidity is 80% or higher for 8 - 10 hours

Temp is between 68° and 82° F

- *Beauveria bassiana* – whiteflies, thrips, aphids
BotaniGard coffee berry borer

High humidity and free water enhance activity

Sunlight kills fungal spores.

Nematodes - *Steinernema carpocapsae* – banana moth,
Nematac borers (weevil), soil-dwelling insects.
High humidity required

Postharvest Disinfestation Treatments for Export Ornamentals

- Washes and Chemical Dips
- Fogs and Aerosols
- Heat Treatment
- Irradiation
- Systems Approach

Washes and Wipes

Potassium soap-based wash and scrub



Pressure washing



Sponging



Wiping



Cut Flower and Foliage Shipper in Costa Rica

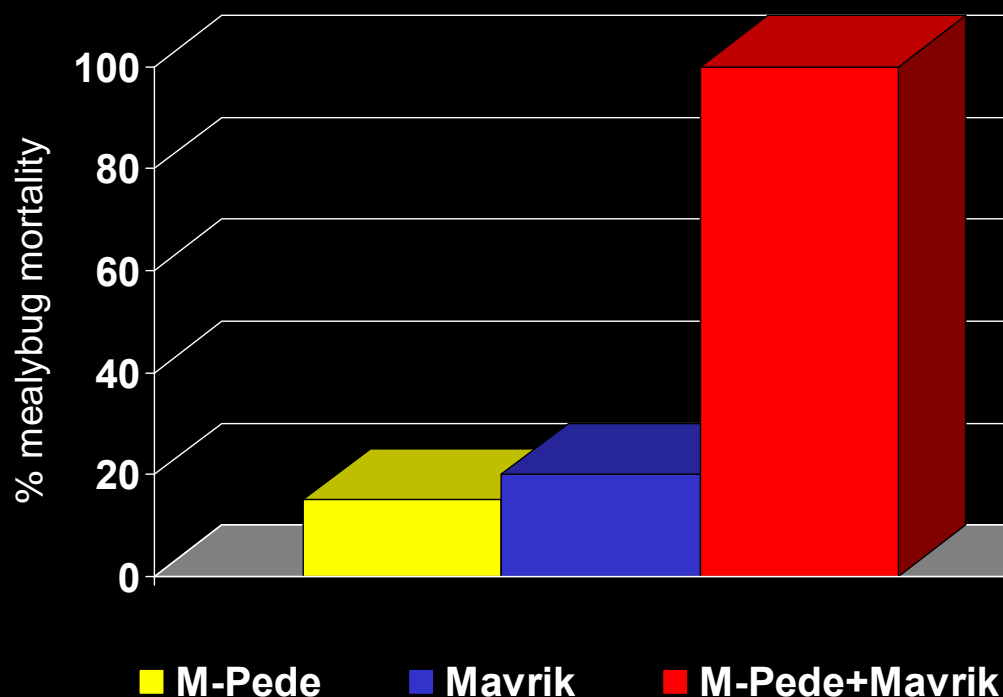


Chemical Dips

- *Mavrik is labeled for use as a dip for flower and foliage cuttings.
- *Broad-spectrum pyrethroid effective against aphids, leafhoppers, mites, thrips, whiteflies.
- *In tank-mix with insecticidal soap (M-Pede), effectiveness against mealybugs is significantly increased.



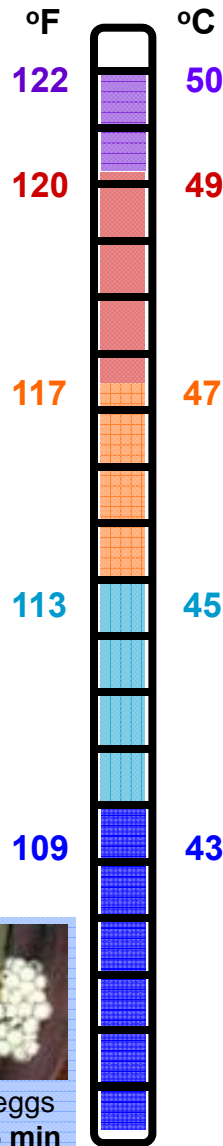
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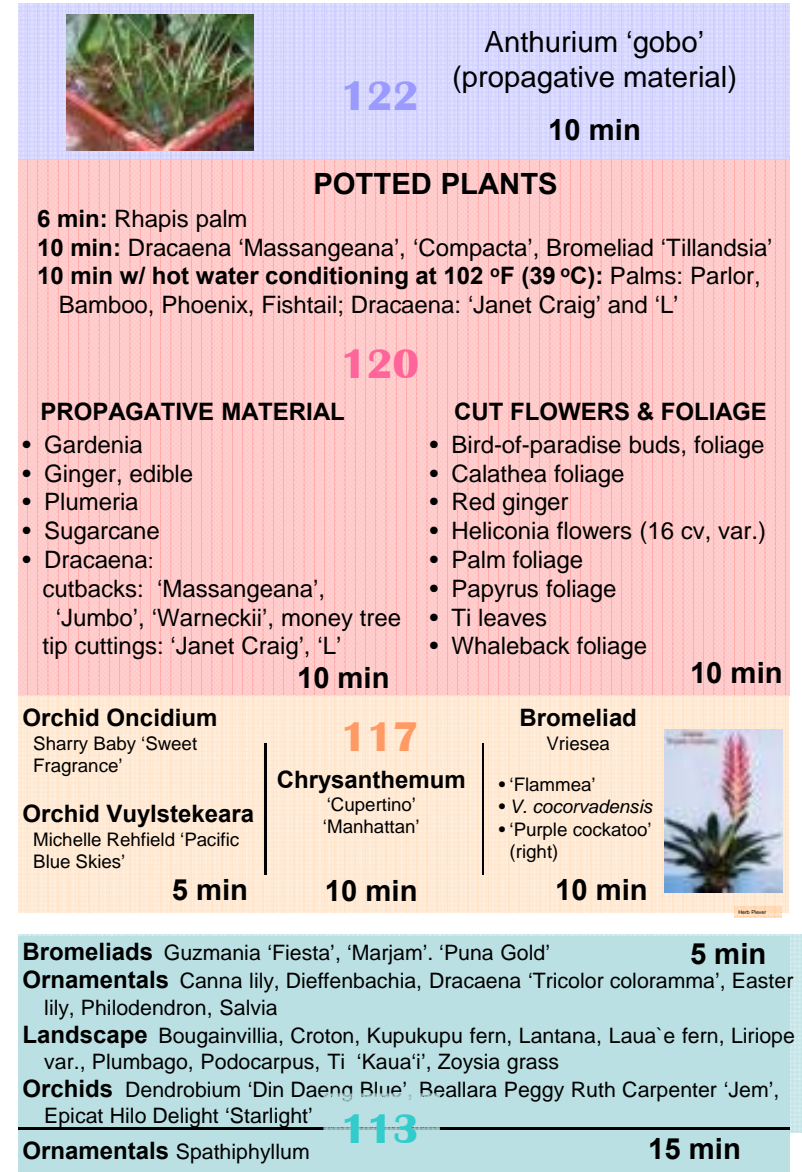
All photos by UH CTAHR unless otherwise noted.

University of Hawai'i at Mānoa, College of Tropical Agriculture and Human Resources, Beaumont Agric. Research Center, Hilo, HI

(lowest temperature, shortest duration to achieve 100% mortality)



(highest temperature, longest duration tolerated)



Insect Mortality at 120° F (49°C)

(Insects on or in plant host)



> 99% mortality

Insect	(min)
Ant	0.5
Aphids (banana, cotton)	1.0
Taro root aphid	5.5
Cockerell scale (armored)	6.0
Green scale (soft)	7.0
Spiraling whitefly	10.0
Mealybugs	12.0
Burrowing nematodes	15.0

Coqui frog & eggs	43 C	5.0
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Beneficial Effects of Hot Water

49 C for 10 min

PREVENTS ABSCISSION



Treated

Untreated

Sexy pink heliconia

**EXTENDS VASE LIFE
BY CONTROLLING
SPIDER MITES**



Untreated

Treated

Ti leaves

PREVENTS GEOTROPISM



Treated

Untreated

Red ginger

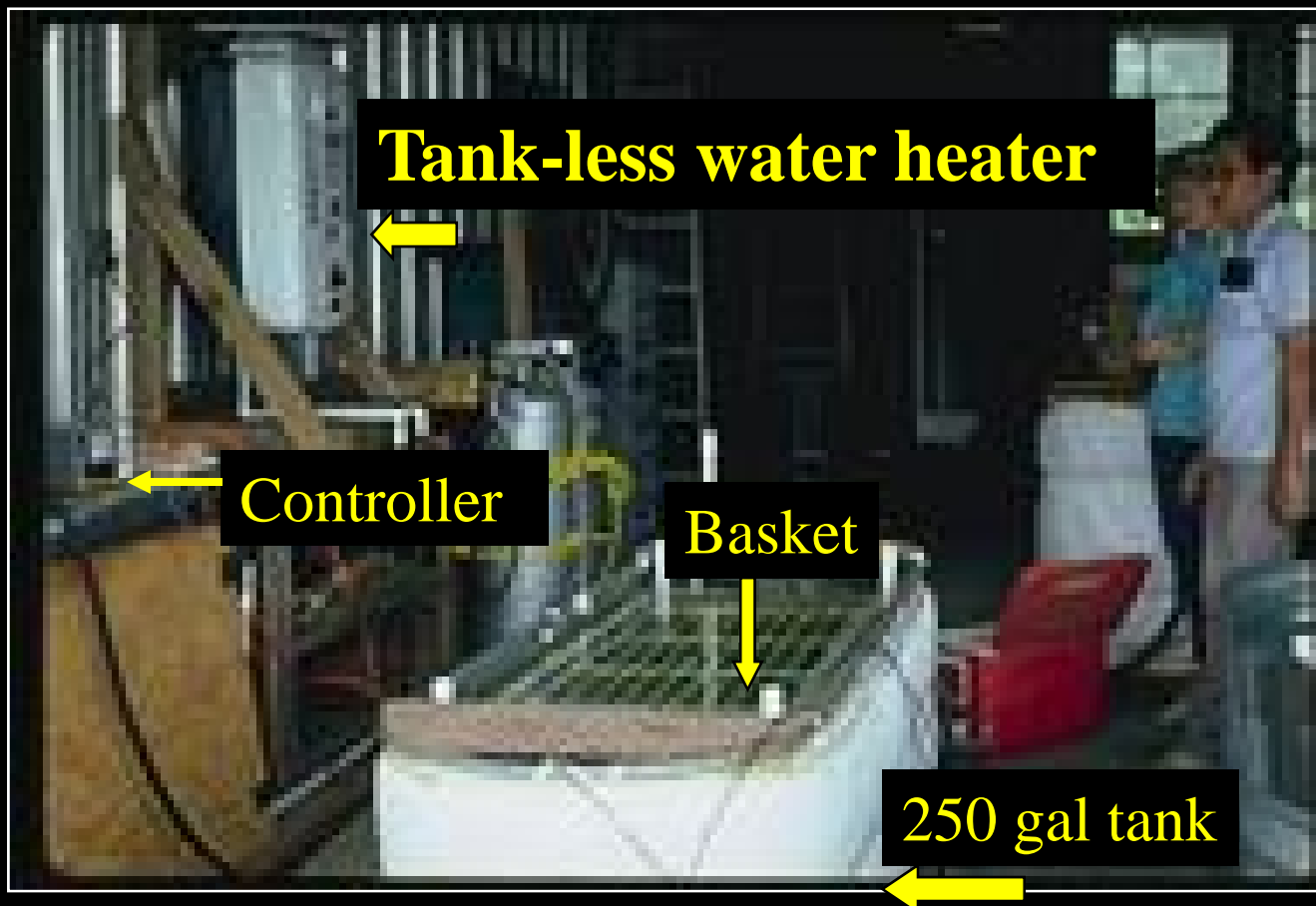
Treating Propagative Materials with Hot Water & Rooting Hormone

(49° C for 10 min + 0.8% indole butyric acid (IBA) rooting hormone)

	<u>Number of roots</u>	
	Hot water + IBA	IBA only
Dracaena 'Janet Craig'	2.2	1.1
Dracaena 'Massangeana'	8.3	3.3
Plumeria	12.4	3.2
Gardenia (cape jasmine)	118.3	15.6



Hot-Water Dip Tank



Basket loaded
w/ red ginger



Hot Water Treatment Recognized as Effective by CDFA



Notifies inspector that insects may appear live; hot water preserves soft bodied insects

NOTICE OF TREATMENT

PRODUCTS DIPPED IN HOT WATER

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> Ginger Pink | <input type="checkbox"/> Ginger Red |
| <input type="checkbox"/> Bird of Paradise | <input type="checkbox"/> Bird Leaves |

Palm Leaves:

- | | |
|-------------------------------------|----------------------------------|
| <input type="checkbox"/> Areca | <input type="checkbox"/> Phoenix |
| <input type="checkbox"/> Queen Sago | <input type="checkbox"/> Rhaps |
| <input type="checkbox"/> Ti Leaves | |

The shipper performed this treatment without official regulatory supervision at origin. Insects killed by this treatment may appear "fresh" or "alive." **DO NOT REJECT FOR INSECTS UNLESS IT IS DETERMINED THEY ARE ACTUALLY ALIVE THROUGH AN APPROVED MANNER. IF NECESSARY, CONTACT CDFA'S Pest Exclusion Branch for further information.**

FLORAL RESOURCES, INC. HAWAII
175 E. KAWAILANI ST
HILO, HAWAII 96720
PH: (808) 959-5851/FAX: (808) 959-2077

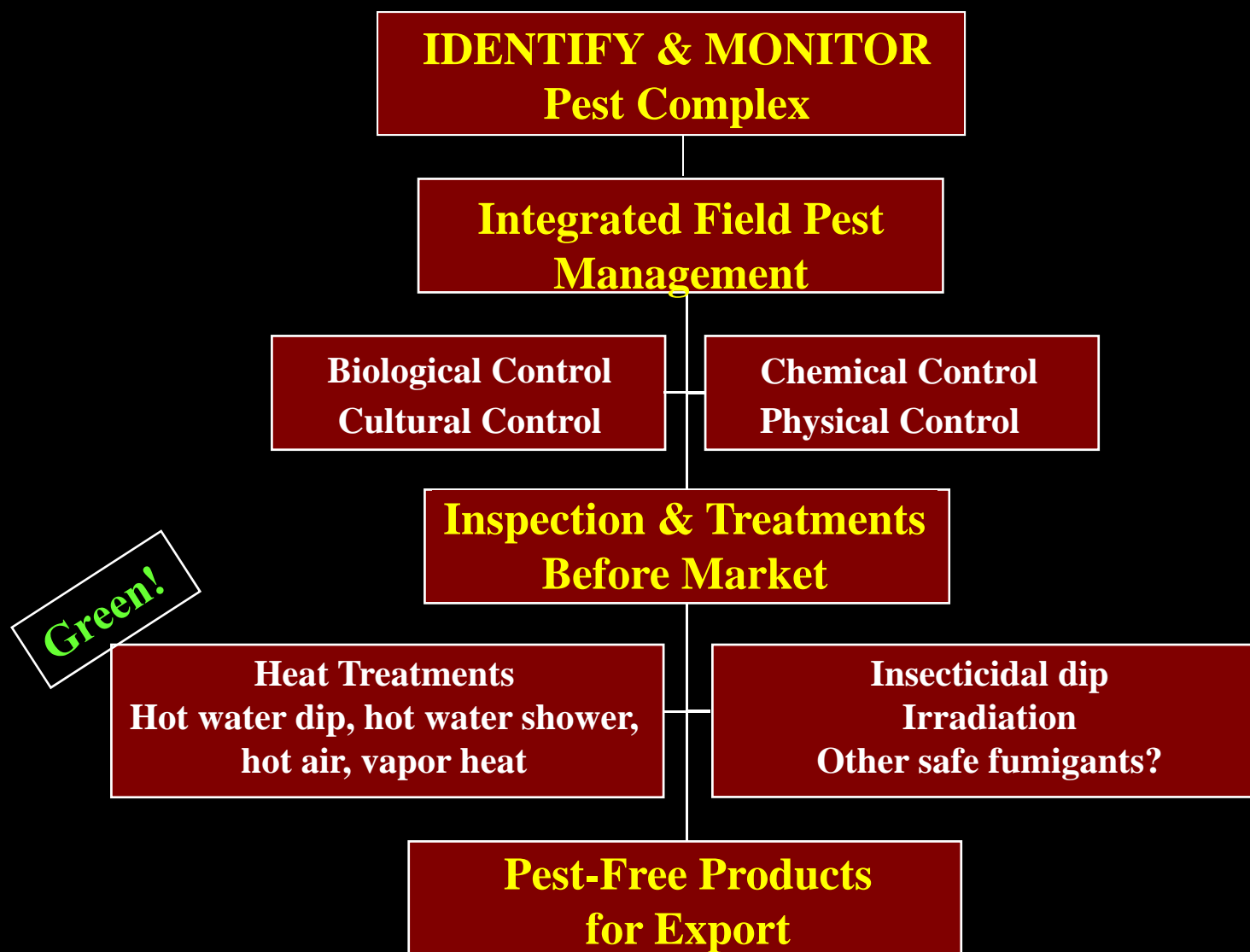
Systems Approach for Red Ginger



Field Treatment	% flowers infested w/ mealybug	
	<u>No postharvest dip</u>	<u>Mavrik/Soap</u>
Foliar Dursban	3	0
No Treatment	12	17

Overall Control Strategy

The Systems Approach

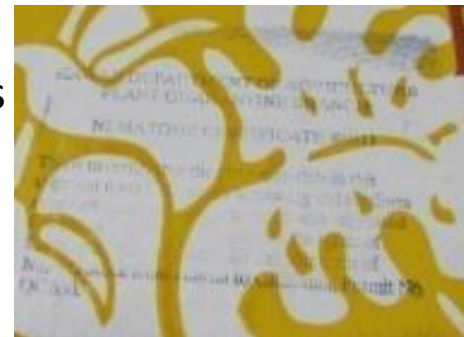


FedEx Distribution Center Near San Francisco Airport in San Mateo County



Summary

- *CA considers Hawaii high-risk for quarantine pests, similar to Florida.
- *USDA, Limited Permit Stamps, State Certifications on boxes do not prevent inspections.
- *Only boxes with origin inspection stickers are not opened.
- *Replace rubber stamp permits and certificates with stickers.
- *Invite personnel from CDFA and/or CDFG to discuss origin inspection programs for cut flowers and potted plants.
- *Public outreach program on shipping clean fresh flowers and foliage to California.



A BIG THANK YOU!

For assistance:

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