

New Agricultural Pests on Oahu

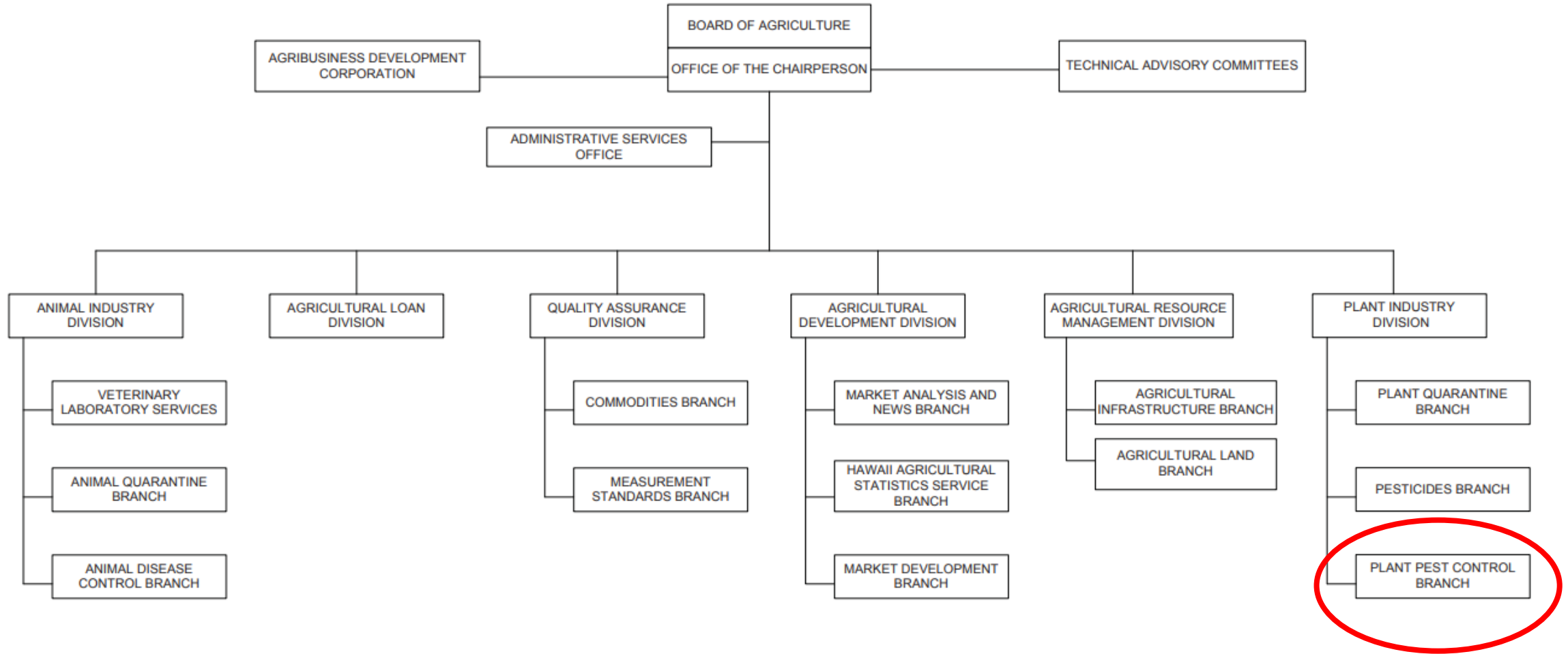
Jordie Ocenar, Pest Control Technician

Plant Pest Control Branch, Hawaii Department of Agriculture

“CTAHR Ground Support:” Research-based Support for Oahu’s Fast-Paced Edible Crop Industry Workshop

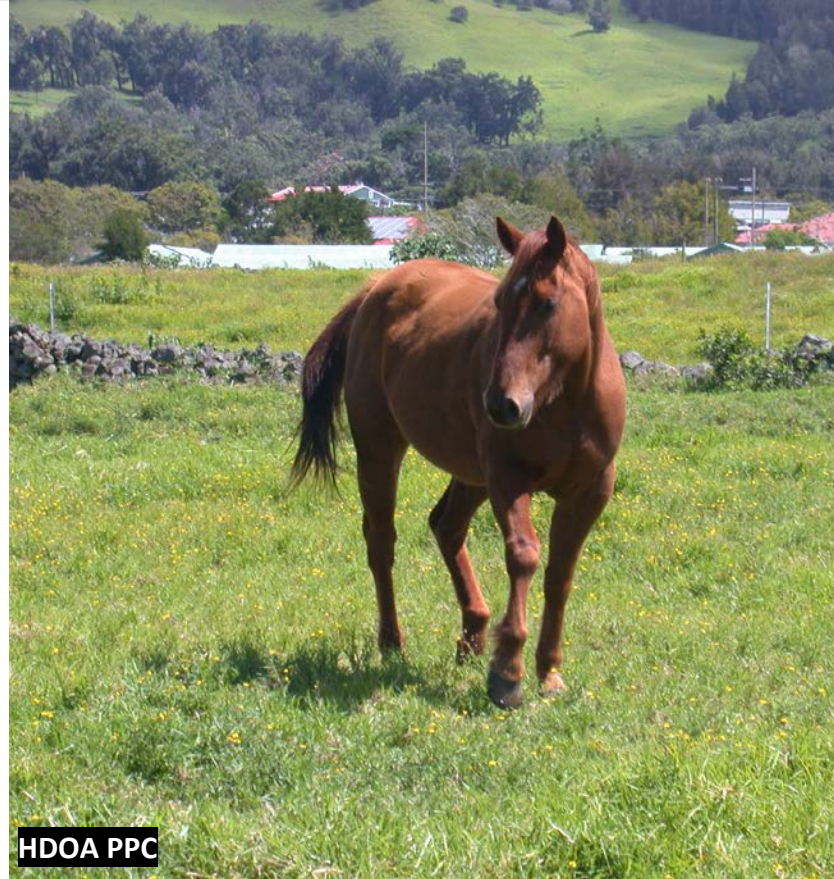
Leeward Community College, August 1, 2018

Hawaii Department of Agriculture Plant Pathology Unit





HDOA PPC



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Plant Pathology Unit: Biocontrol of Weeds



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Plant Pathology Unit:
Assisting the Plant Quarantine Branch with identifying diseases and
providing expert information on diseases



State of Hawaii
DEPARTMENT OF AGRICULTURE

Mamaki Rust

Pucciniastrum boehmeriae (Dietel) Syd. & P. Syd.
(Pucciniastraceae)



Figure 1. Top view of akolea leaf infected with *Pucciniastrum boehmeriae*; inset: close-up.



Figure 2. Bottom view of view of akolea leaf infected with *Pucciniastrum boehmeriae*; inset: close-up.

Background

In August 2013, a diagnostician at the University of Hawaii (UH) Diagnostic Service Center, Komohana Research Station incidentally identified an unfamiliar rust on a mamaki (*Pipturus albidus*) leaf sample from a Honolulu residential grower on the Big Island. Consequently, the rust was sent to the United States Department of Agriculture, Agricultural Research Systematic Mycology and Microbiology Laboratory (SMML), where it was identified via morphological and molecular means as *Pucciniastrum boehmeriae* (Dietel) Syd. & P. Syd., a new record in both Hawaii and the U.S. A subsequent visit by the UH diagnostician and Hawaii Department of Agriculture (HDOA) staff to the initial detection site yielded only two more slightly rusted leaves. Additional surveys at mostly nurseries and botanical gardens throughout the main Hawaiian Islands failed to detect the *P. boehmeriae* rust. In November 2016, leaf lesions were spotted on wild *Boehmeria grandis* (akolea) plants in the Saddle Peak area of the Koolau Mountains on Oahu by HDOA staff. SMML confirmed the presence of *P. boehmeriae* on the Oahu akolea leaf samples in February 2016, thus increasing the known local distribution and susceptible endemic host plant species within the Urticaceae plant family.

Importance of the Urticaceae in Hawaii

Mamaki, akolea, and other related Hawaiian species in the Urticaceae (nettles) have long been important food sources for various native species of Hawaii. One of these species is the alala (Hawaiian crow- *Corvus hawaiiensis*). While this species is currently extinct in the wild, it is expected to be reintroduced to the island in the near future as part of a captive breeding and reintroduction program. According to the Committee on the Scientific Bases for the Preservation of the Hawaiian Crow (1992), between one third and one half of an adult alala's diet consists of fruit from a handful of native understory plants and climbing vines, including mamaki. Hawaii's official State Insect, the Kamehameha butterfly (*Giant Pacific Skipper*), also depends on *P. albidus* as its preferred host plant. The rust is highly specific to native Urticaceae, including *Boehmeria*, *Neraudia*, and *Urena* (Swezey 1924). According to more recent studies, populations of *Urena* appear to be declining, and can no longer be found in areas where it was historically common (Tabashnik et al. 1992). While this could be due to various factors, additional host plant loss due to this rust could be a contributing factor. *Olona* (*Touchardia latifolia*) were very important to the diet of native Another Hawaiians. Their sap, stems, fruit, and leaves were used for kapa, and for prized cordage. In modern times, *Urena* is cultivated for tea and grown for conservation and native plant restoration.

LYCHEE POWDERY MILDEW

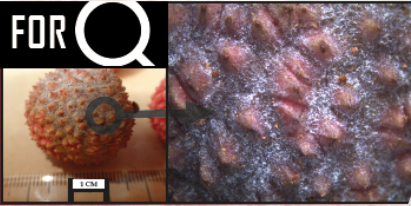
Erysiphe quercicola

Lychee is a popular tree in Hawaii, valued for its delicious fruit. Generally, tree is relatively free of diseases and pests, but during the 2017 growing season a HDOA staffer brought in diseased lychee fruit. The fruits showed signs of powdery mildew, a fungal disease, common in Australia, China and Thailand. This poster briefly introduces the new disease and its management to commercial and home growers.

WHAT TO LOOK FOR

WHITE, POWDERY, FUNGAL GROWTH BETWEEN SPIKES ON LYCHEE RIND

The white-grayish mat of fungal growth is **only** present on the rind or outside of the fruit. This does not affect the edibility of the fruit.



DISTRIBUTION

Positive samples were collected from Waiialua, Pearl City, and Aiea. Surveys of other parts of Hawaii Island were negative. Subsequent surveys will begin once trees are more widely available.

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Plant Pathology Unit: Outreach

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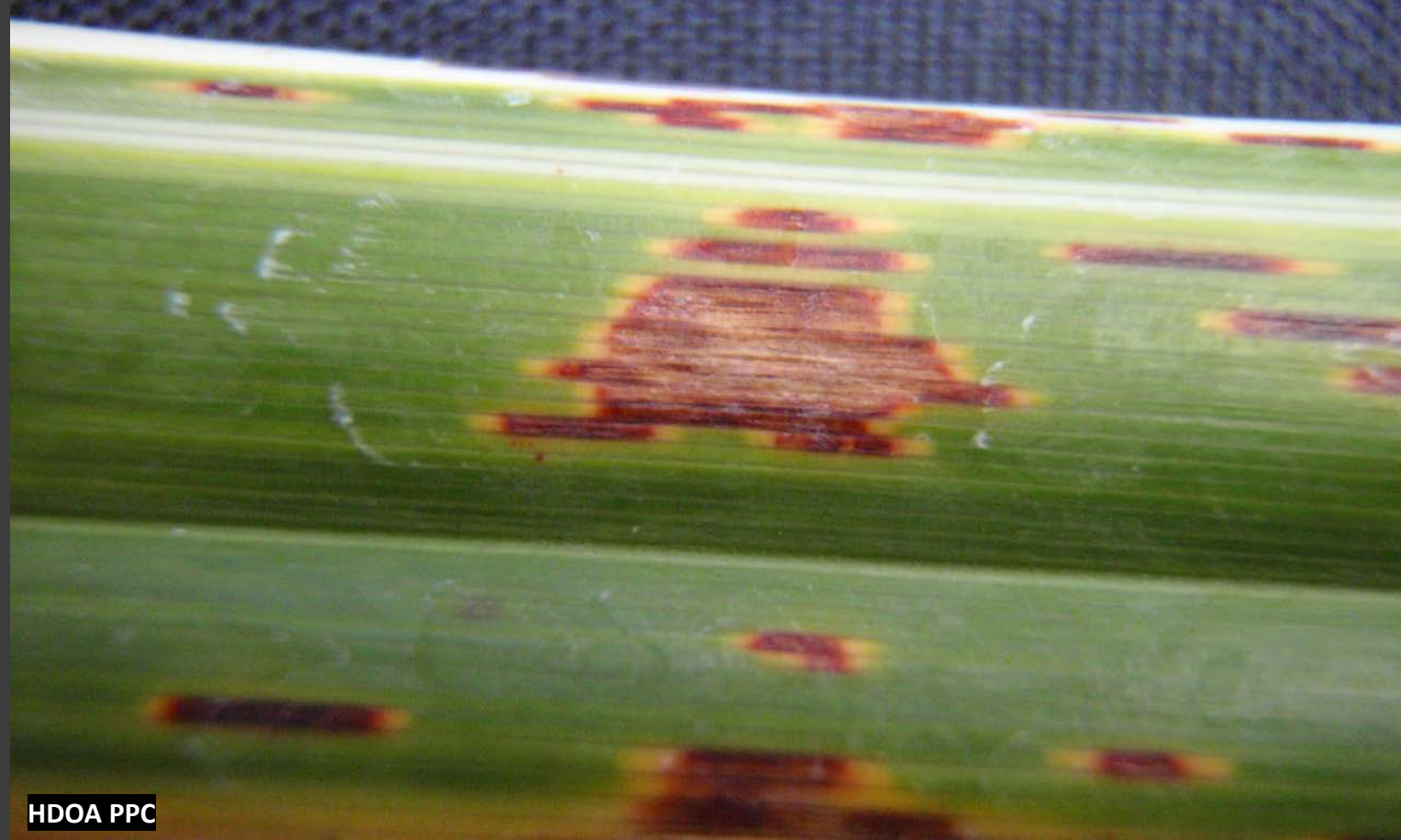
Plant Pathology Unit:
Surveying, detecting, containing, and eradicating new diseases

Dianella Rust

- Host: *Dianella tasmanica* “Variegata”
- Common Name: Tasman Flax Lily
- Pathogen: *Puccinia hemerocallidis*
- First Report: Oahu
- Distribution: Widespread
- Damage: Browning of leaves and leaf spots



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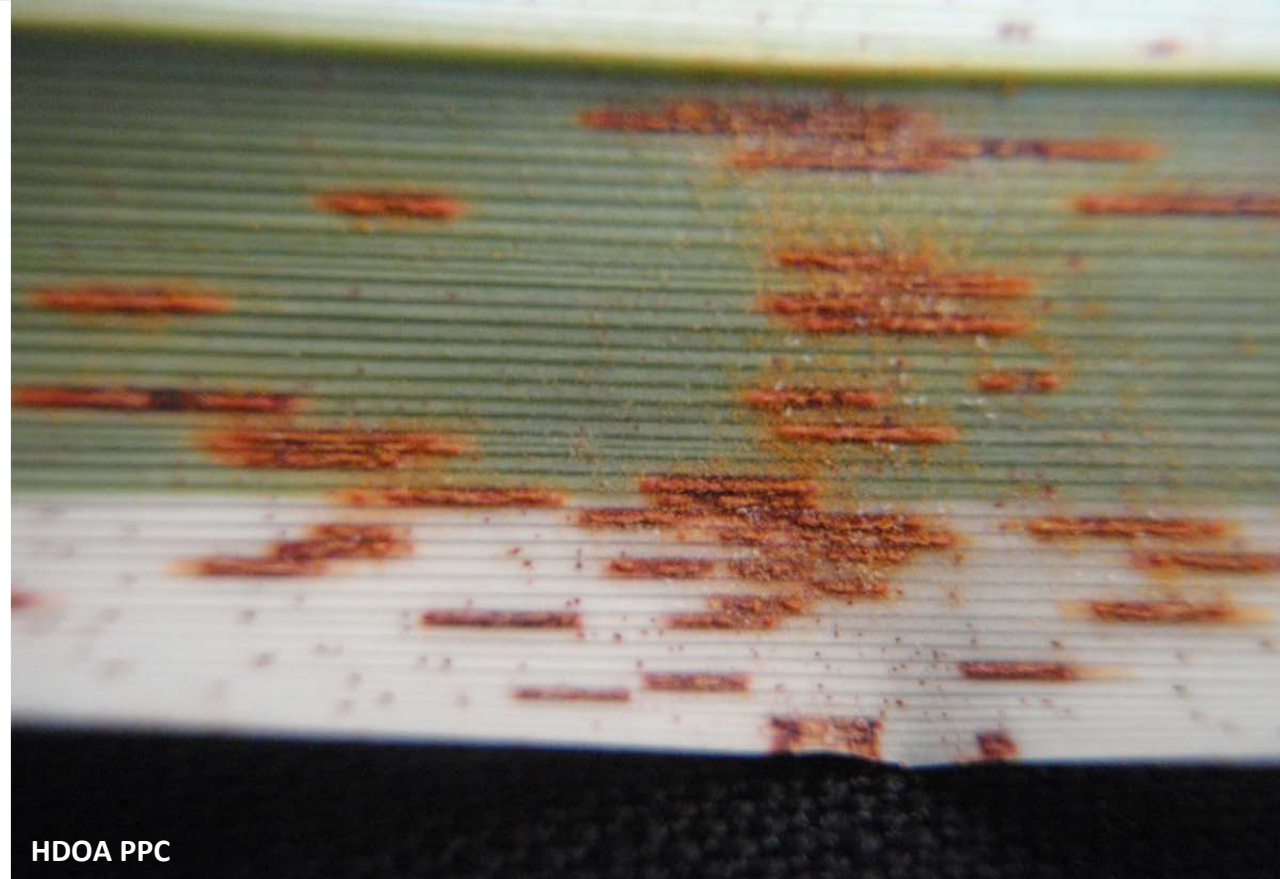


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Dianella Rust Symptom:
Brown leaf lesions with
yellow borders



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Dianella Rust Symptom:
Orange-Brown rust pustules on leaves

African Tulip Tree Powdery Mildew

- Host: *Spathodea campanulate*
- Common Name: Flames of the forest, fountain tree, or fireball
- Pathogens (2): Tentatively *Oidium* sp. and *Ovulariopsis* sp.
- First Report: Oahu
- Damage: Unthrifty growth and leaf drop





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Tentatively *Oidium* sp.
Discolored patches,
No mottling or chlorosis



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Tentatively *Ovulariopsis* sp.
Mottling and chlorosis

African Tulip Tree Powdery Mildew Symptoms



Tentatively *Oidium* sp.

White powdery growth on
upper and lower surface of leaf

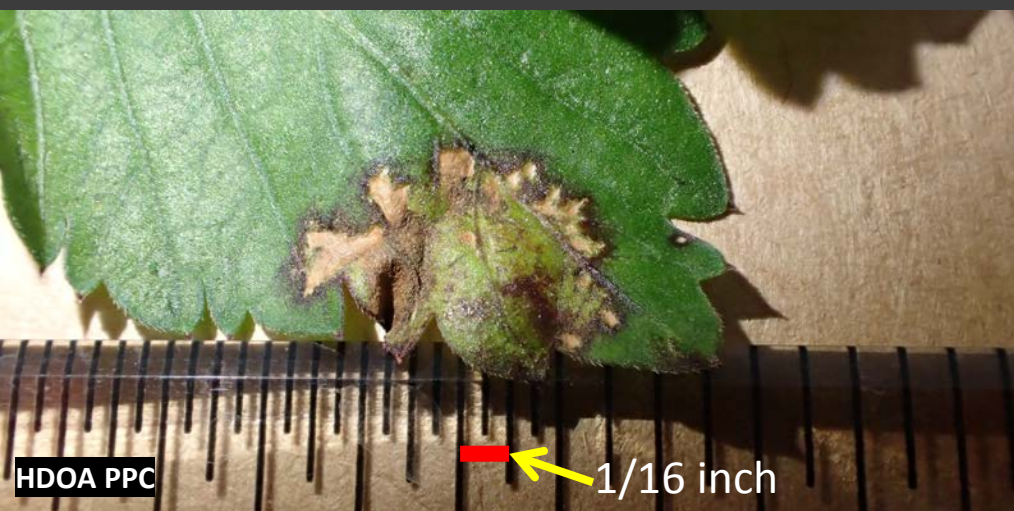
Tentatively *Ovulariopsis* sp.

White powdery growth on
only under surface of leaf

African Tulip Tree Powdery Mildew Symptoms

Bidens sp. Downy Mildew

- Host: *Bidens* sp.
- Pathogen: *Plasmopara halstedii*
- First Report: Maui
- Could possibly affect native, other *Bidens* sp., or closely related asteraceous species (e.g., sunflowers)



Bidens sp. Downy Mildew Symptoms:
Chlorotic and necrotic lesions
on upper leaf surfaces



Bidens sp. Downy Mildew Symptoms:
White fuzzy growth on lower leaf surface


Amaranth

White Blister Rust


- Host: *Amaranthus* sp.
- Common Name: Amaranth
- Pathogen: *Albugo bliti*
- First Report: Hawaii Island
- Damage: Reduces economic or aesthetic values of edible or floral species, respectively.



Amaranth White Blister Rust Symptom:
White rust pustules on upper and lower leaf surfaces

A close-up photograph of an Amaranth plant. The leaves are bright green but show signs of distress, including yellowing (chlorosis) and brown, necrotic spots. A small, developing flower cluster is visible in the center. The background is a blurred green field of similar plants.

Amaranth
White Blister Rust
Symptom:
Leaf chlorosis
and necrosis

A photograph of an amaranth plant in a field, showing symptoms of white blister rust. The plant is stunted and has distorted, curled leaves. A person's hand in a blue denim glove is holding the plant. The background shows other plants and a grey plastic mulch.

Amaranth White
Blister Rust Symptom:
Stunting and
leaf distortion

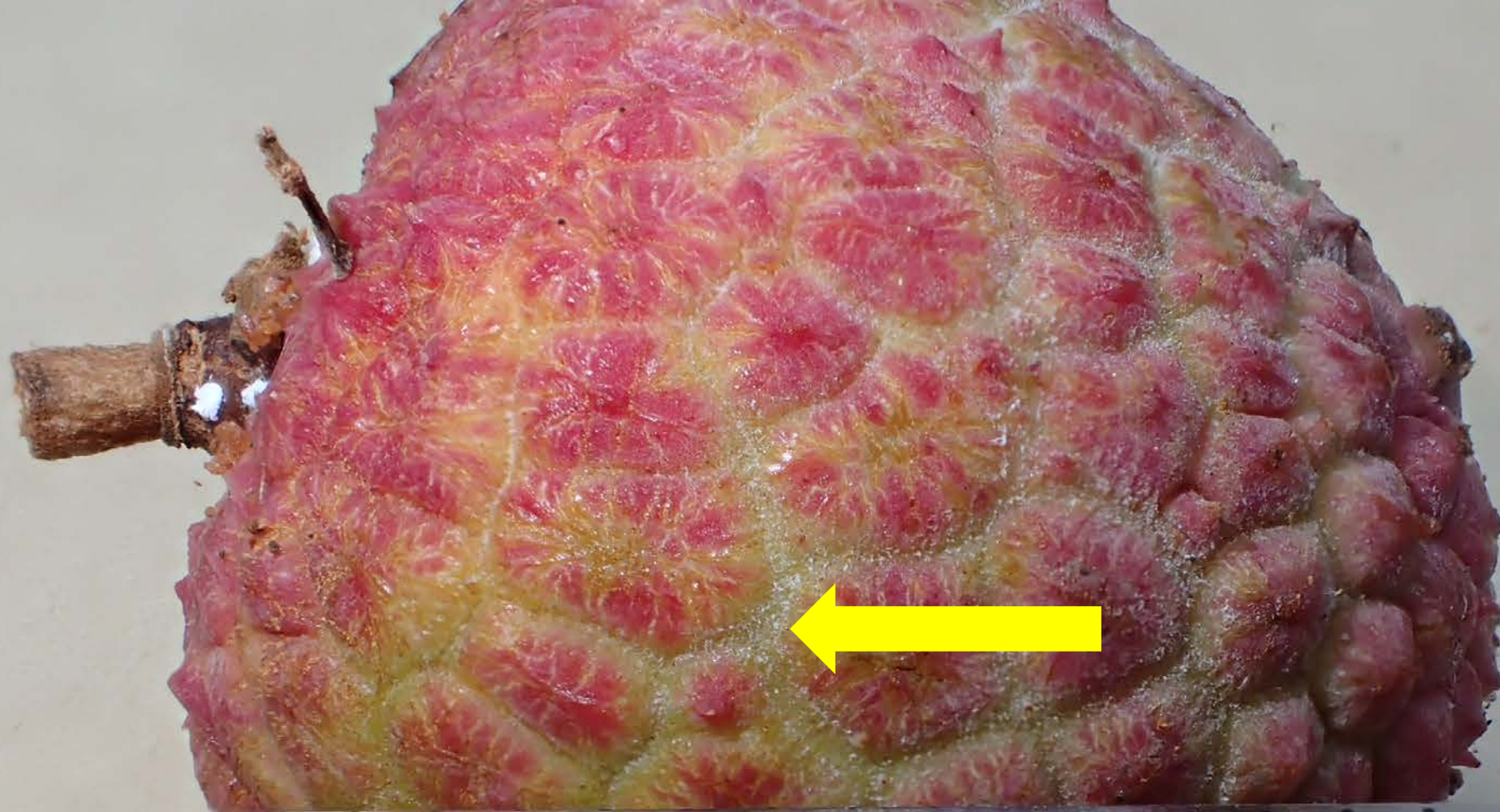
Lychee Powdery Mildew

- Host: *Litchi chinensis*
- Common Name: Lychee
- Pathogen: *Erysiphe quercicola*
- First Report: Oahu
- Damage: Reduces aesthetic value and shelf life of fruits





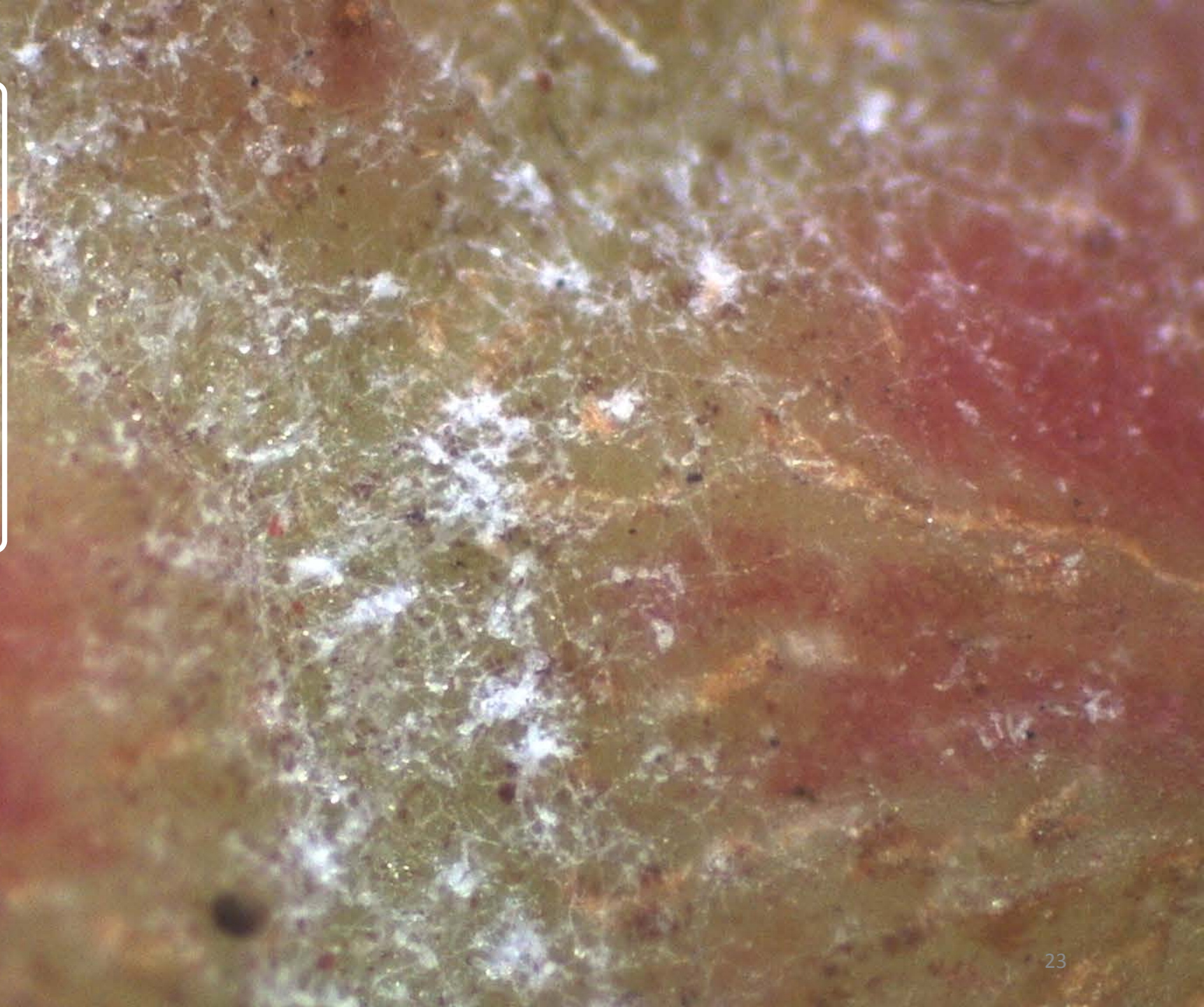
Lychee Powdery Mildew Symptom:
White powdery growth
between segments



1/16
inch

Lychee Powdery Mildew Symptom:
White powdery growth between segments

Lychee Powdery Mildew
Symptoms:
White Powdery
growth between
segments or
tubercles of a fruit





Healthy lychee tree

Thick fruit bunches
Fruits bright and blemish free

Infected lychee tree

Thin fruit bunches
Fruits dull and dirty-looking



MOST UNWANTED: Okra Powdery Mildew

Okra Powdery Mildew

- Host: *Hibiscus* or *Abelmoschus esculentus*
- Common Name: Okra
- Pathogen: *Fibroidium abelmoschi*
- First Report: Oahu
- Damage: Possibly defoliation and yield reduction of marketable pods





Okra Powdery Mildew Symptom:
White powdery growth on upper and lower leaf
surface

Generalized Means of Disease Spread

- Infected propagative plant materials, like seedlings and seeds
- Contaminated fields or soil
- Contaminated tools (e.g., trimmers or pruners; transportation vehicles)
- Wind, splashing rain and free running water
- Cool and humid weather
- Availability of susceptible weedy hosts and disease vectors nearby

Generalized Control Methods for Fungi

- Buy clean seeds or plants
- Field Sanitation (e.g., removal of infected plants, weeds and insect vectors)
- Sanitation of tools
- Reduce splashing water to reduce spread of disease inoculum; use drip irrigation rather than overhead
- Good spacing between plants that increases air flow
- Use of resistant cultivars if available
- Fungicides labeled for host and fungi at disease onset (Consult the County Extension Agent for licensed fungicides in Hawaii).

Questions?

Contact us:
HDOA.PPC@HAWAII.GOV

