



The Role of the Pathology Group in Florida

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Introduction

USDA-APHIS-PPQ Pathologists are responsible for a number of activities within the Citrus Health Response Program (CHRP), including but not limited to disease identification on suspect samples collected during survey activities of residential and commercial groves, or inspections of citrus nursery stock and packinghouse fruit.

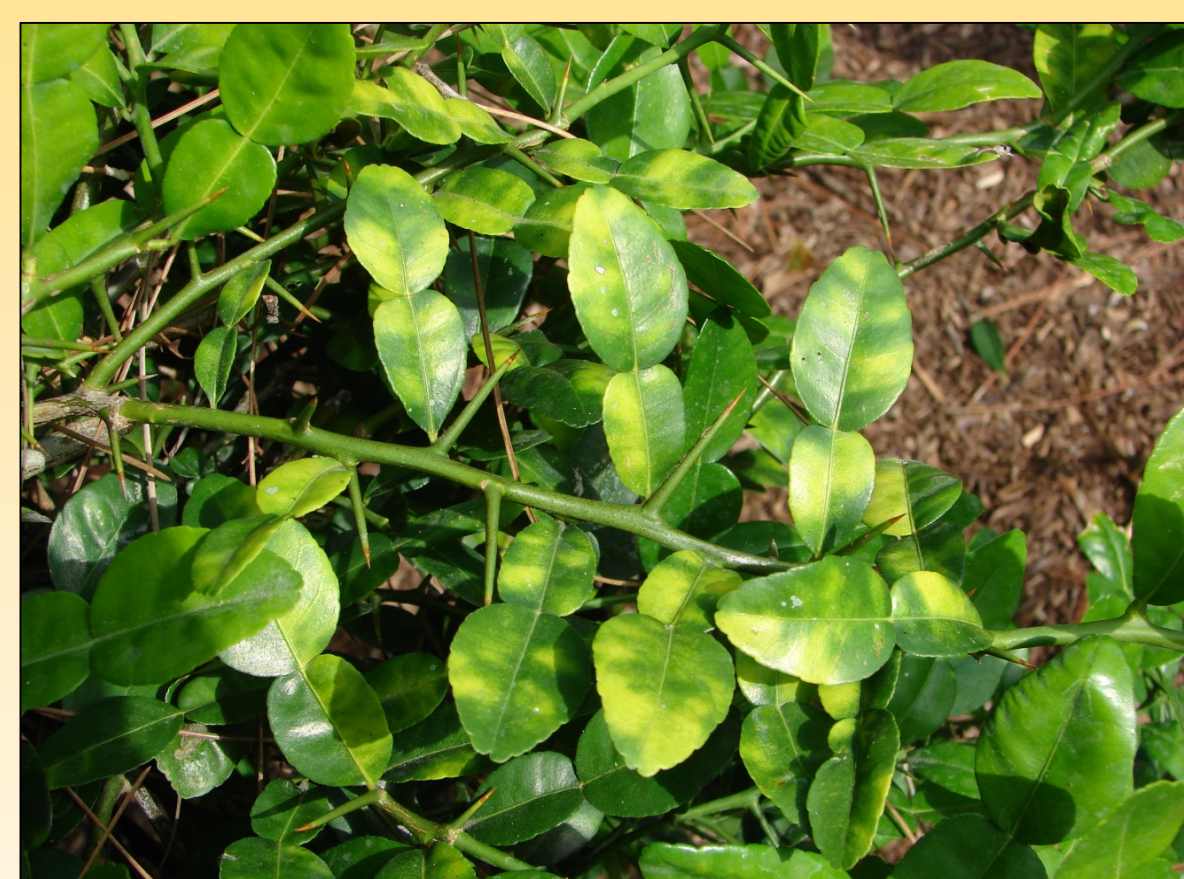
In Florida, diseases of regulatory concern are citrus canker, Huanglongbing, citrus black spot, and sweet orange scab. Other exotic diseases such as citrus leprosis and citrus variegated chlorosis are also on the multi-pest survey (MPS) list.

Since October 2005, a total of 12,976 plant samples from field surveys have been submitted to pathologists for screening and initial identification. Final confirmation is provided by a diagnostic laboratory according to the protocols outlined in the New Pest Response Guideline for each targeted disease.

Citrus canker



Huanglongbing



Citrus black spot



Sweet orange scab



Training & Annual Proficiency Assessments

New Employee Training		
Day 1	Day 2	Day 3
9:00-10:00 Common citrus diseases	9:00-9:45 ACP Monitoring	9:00-10:00 Field Trip
10:00-11:00 CC, HLB, CBS, CLV, SCS	9:45-10:30 Sample Collection and Submission	10:00-11:00 Perfecting observational skills
11:00-11:45 CC, HLB, BSC, CLV, SCS continued	11:00-12:00 Citrus Varieties	11:00-12:00 Perfecting observational skills
Lunch 12:00-12:30	Lunch 12:00-12:30	Lunch 12:00-12:30
12:30-13:30 Digital Photography	12:30-13:30 Citrus Varieties continued	12:30-13:30 Field Trip
13:30-14:15 Digital Photography continued	13:30-14:30 Open Discussion and Review	13:30-14:30 MPS Sample Collection practice
14:30-16:30 Return to Duty Station	14:30-16:30 Return to Duty Station	14:30-16:30 Return to Duty Station
Separate hand-held data collection device training (IPHIS and Mobile IPHIS Survey Tool (MIST))		



To maintain the skills of CHRP employees at a high level of competence, the Pathology team has developed an intense training program. Training activities include citrus disease and variety identification, digital imaging, sample collection and submission, Asian citrus psyllid (ACP) monitoring and data collection using hand-held electronic devices. Data collection represents an important part of the ACP monitoring protocol to support growers participating in the Citrus Health Management Areas (CHMAs). To carry out this activity, CHRP employees are trained in the use of the Integrated Plant Health Inspection System (IPHIS) and the Mobile IPHIS Survey Tool (MIST). Together all skills are tested annually to determine the level of proficiency achieved by each field technician. Adjustments to training modules are made based on test results, which in turn identify specific technician needs to improve their skill set. For this purpose, nationally recognized training materials have been developed.

Sample Evaluation & Processing, Disease Diagnosis & Risk Assessment Reports



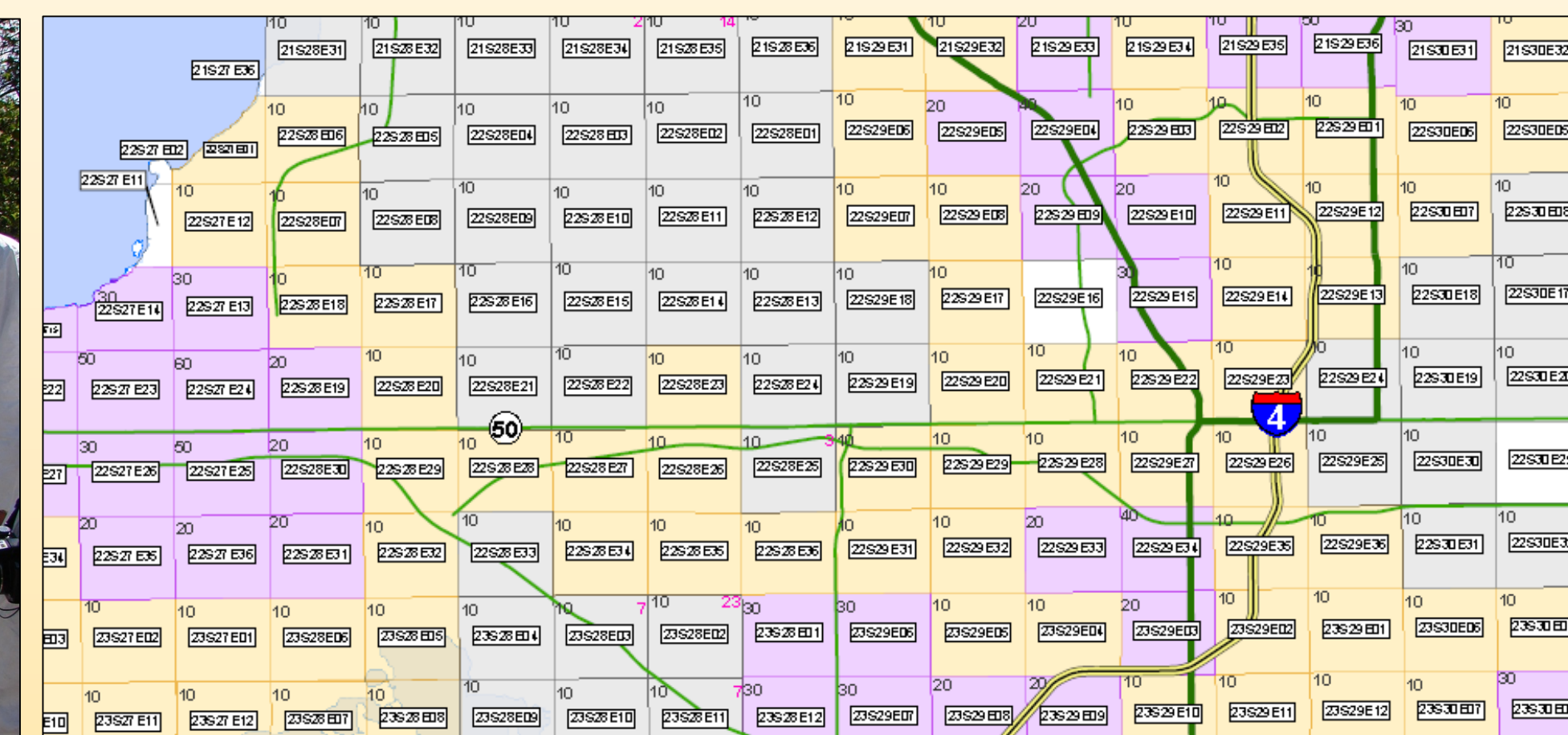
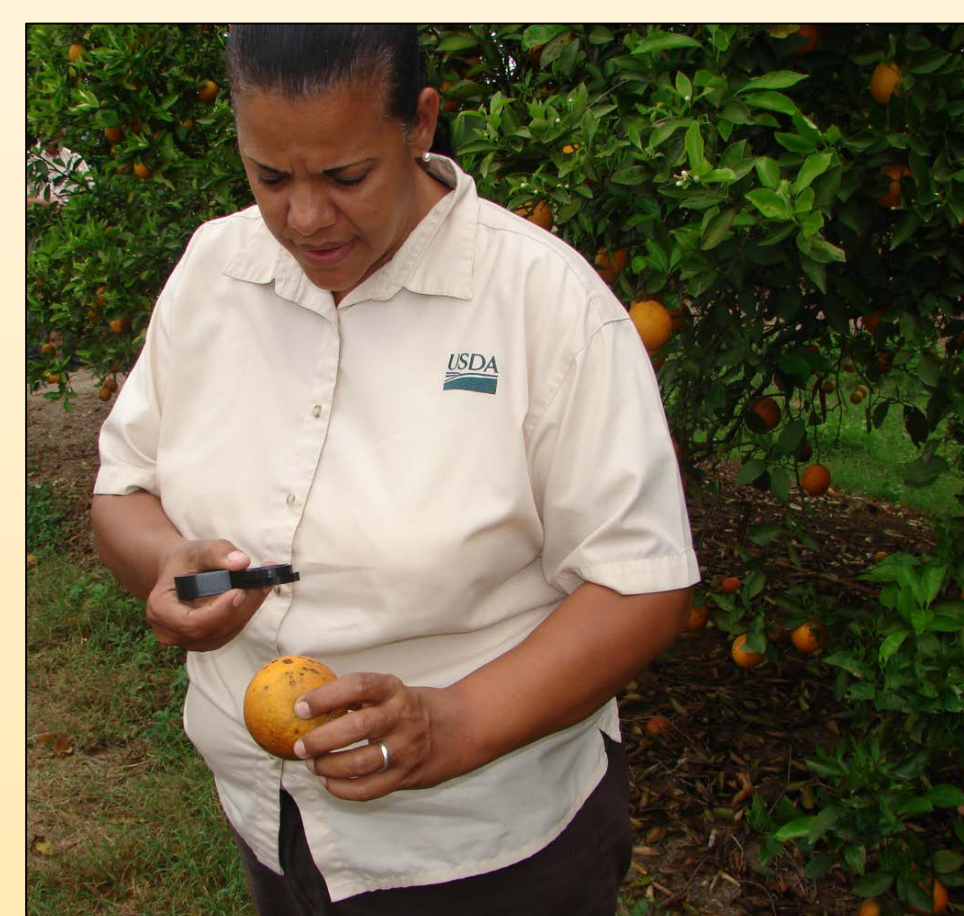
DATE (m/d/y) 1/19/2015 TIME 1415
LOT# 557
VBO 2014/2015
HARVEST PERMIT# 13318
E-RS 34-37-16
PAL/BLK? 5/13
METROCK/ash-blocker SUBMIT? D2 VARIETY RD GET
PACKINGHOUSE RIVERFRONT
PHOTOGRAPHER LIZ BENNETT NEXTEL# 23
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Citrus Health Response Program
Packinghouse Specimen Report
Date reported (m/d/y) 1/19/2015
Time (MST) 14:15
Packinghouse (MST)
County (FL) Lake
Lot# 557
VBO 2014/2015
HARVEST PERMIT# 13318
E-RS 34-37-16
PAL/BLK? 5/13
METROCK/ash-blocker SUBMIT? D2
VARIETY RD GET
PACKINGHOUSE RIVERFRONT
PHOTOGRAPHER LIZ BENNETT
NEXTEL# 23
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Citrus packinghouse inspections of harvested fruit have detected citrus canker symptoms in 741 out of 929 suspect lots presented for diagnosis during harvest seasons 2006-2007 to 2009-2010. From seasons 2010-2011 to 2014-2015, domestic shipment regulations were amended and fruit was no longer inspected for interstate commerce. However, fruit shipments intended mainly for the European Market are still inspected. Since the 2010 season to present, 250 lots containing suspect citrus canker symptoms were evaluated with 201 lots resulting in a positive diagnosis. Over a period of 9 harvest seasons in Florida, 80% of all lots with suspect symptoms resulted in a positive confirmation for citrus canker. Of the 12,976 field samples submitted to CHRP pathologists for screening and initial identification since October 2005, 71% and 29% were confirmed as Huanglongbing (citrus greening disease) and citrus canker respectively. Both are considered to be the two most important diseases threatening the citrus industry in the State.

Development of Survey Methodologies & Risk-based Models



Over a period of 15 years, pathologists have also assisted in the development and implementation of field survey methodologies in collaboration with the United States Department of Agriculture Horticultural Research Laboratory (USHRL) and the Center for Plant Health Science and Technology (CPHST). Epidemiological characteristics of pathogens, pests, and hosts were considered in the development of these detection surveys, which were then coupled with US population census and international travel data. CHRP currently utilizes both detection and delimiting risk-based models to conduct surveys intended to target specific citrus diseases. Each year the survey model is adjusted based on risk factors that increase the likelihood of finding targeted pests.

Pathologists today play a significant role in developing survey techniques and maintaining chain of custody protocols for suspect samples collected during inspections. The CHRP pathology team has developed a systematic approach to pest detection from personnel training and specimen diagnosis to development of survey methodologies and their implementation.

Support to Federal and State cooperators nation-wide has been a priority for CHRP pathologists. Citrus disease identification training has been conducted in several states including field training sessions which were held in Florida to visit sites currently expressing disease symptoms in various stages of severity and incidence. Customized stakeholder training activities have ranged from individual citrus growers, to employee training for the Florida Citrus Nursery Industry. Additionally, providing support for research and regulatory functions have led to the development of new diagnostic methods, web-based training programs, and Citrus Health Management Area performance rating assessments.

Support has also been provided to International organizations such as Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA), and North American Plant Protection Organization (NAPPO). Additionally, support on field detection strategies for citrus diseases has been requested by and delivered to Mexico and Colombia via on-site visits.