Impact of Rust Diseases on the Florida Sugarcane Industry

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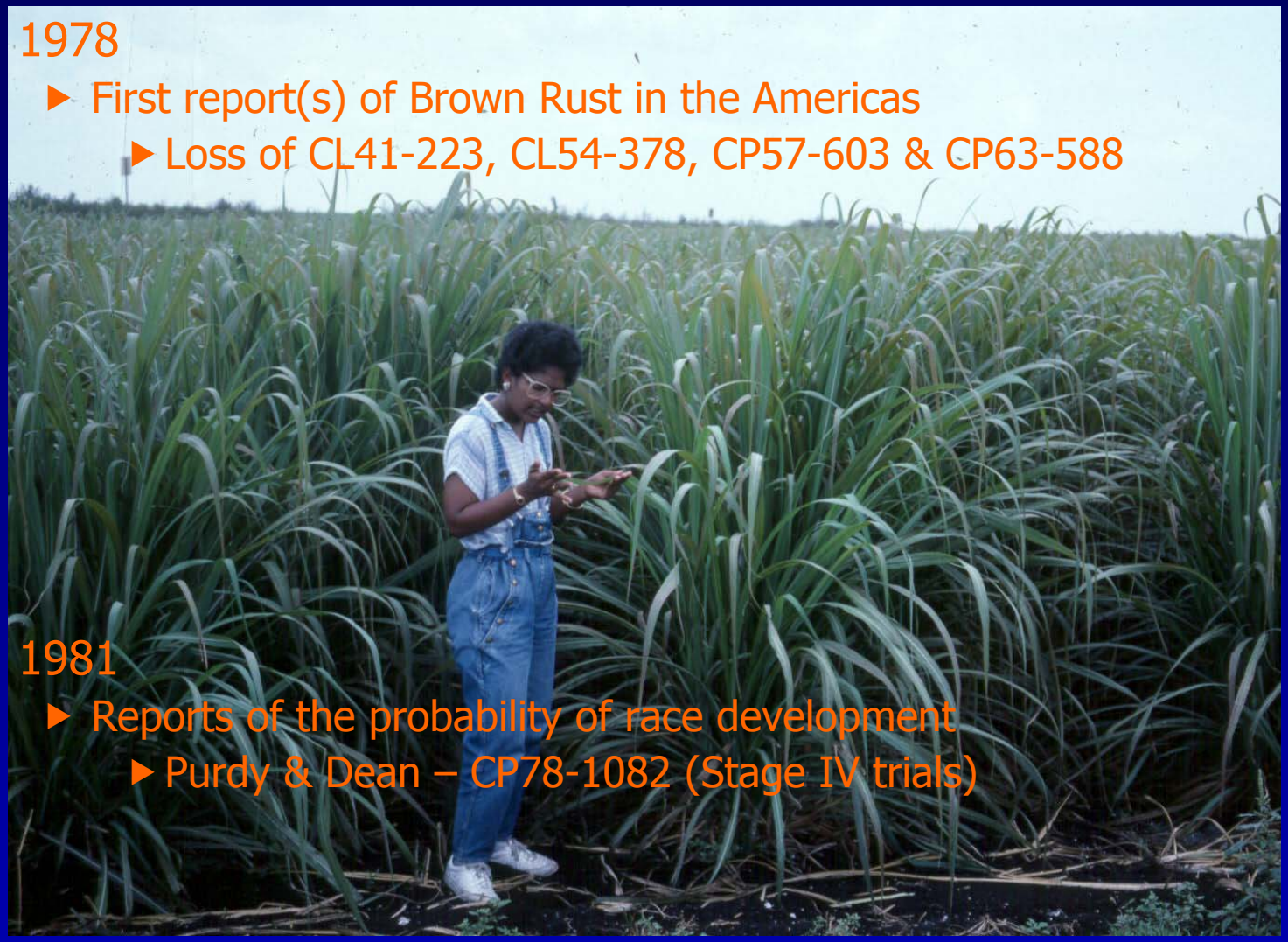
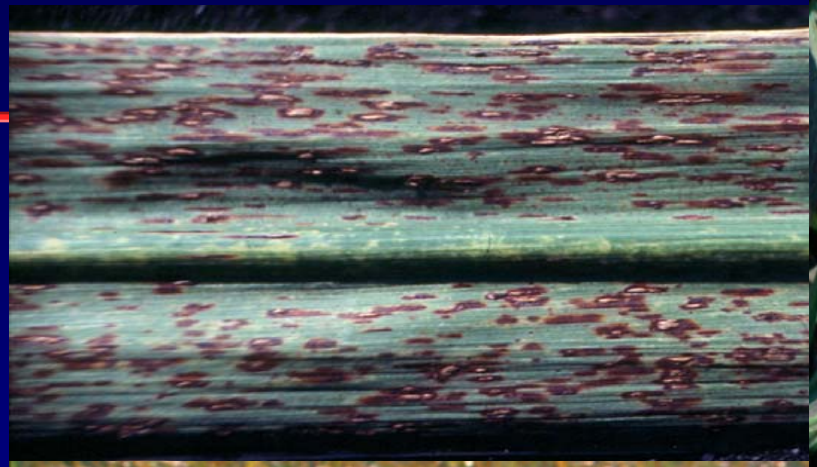
History

- 1978
  - First report(s) of Brown Rust in the Americas
    - Loss of CL41-223, CL54-378, CP57-603 & CP63-588



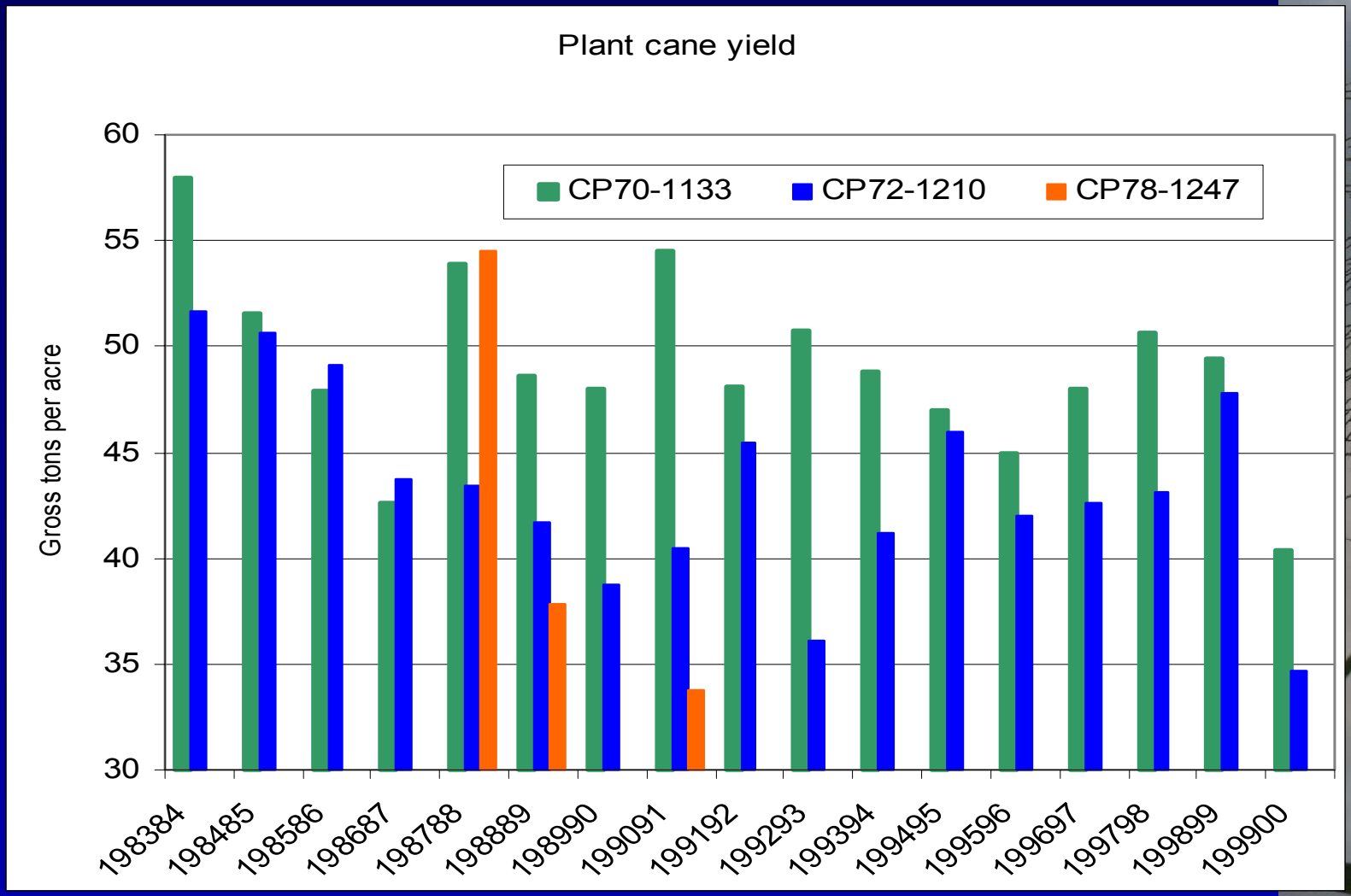
- 1981
  - Reports of the probability of race development
    - Purdy & Dean – CP78-1082 (Stage IV trials)



Brown Rust Solutions

- Breed – Breed – Breed
- Rogue – Rogue – Rogue
- Lose – Lose – Lose
- Successful Releases – i.e. assumed durable resistance
  - CP72-2086
  - CP70-1133
  - CP80-1743
  - CP78-1628
  - CP74-1547
- Resulting recommendations
  - Diversify planting
    - Max. 25% of any one genotype on the farm
  - Could maintain some CP72-1210 through diversification
    - (premiere cultivar for hand cutting)

CP78-1247 – Cane Yield



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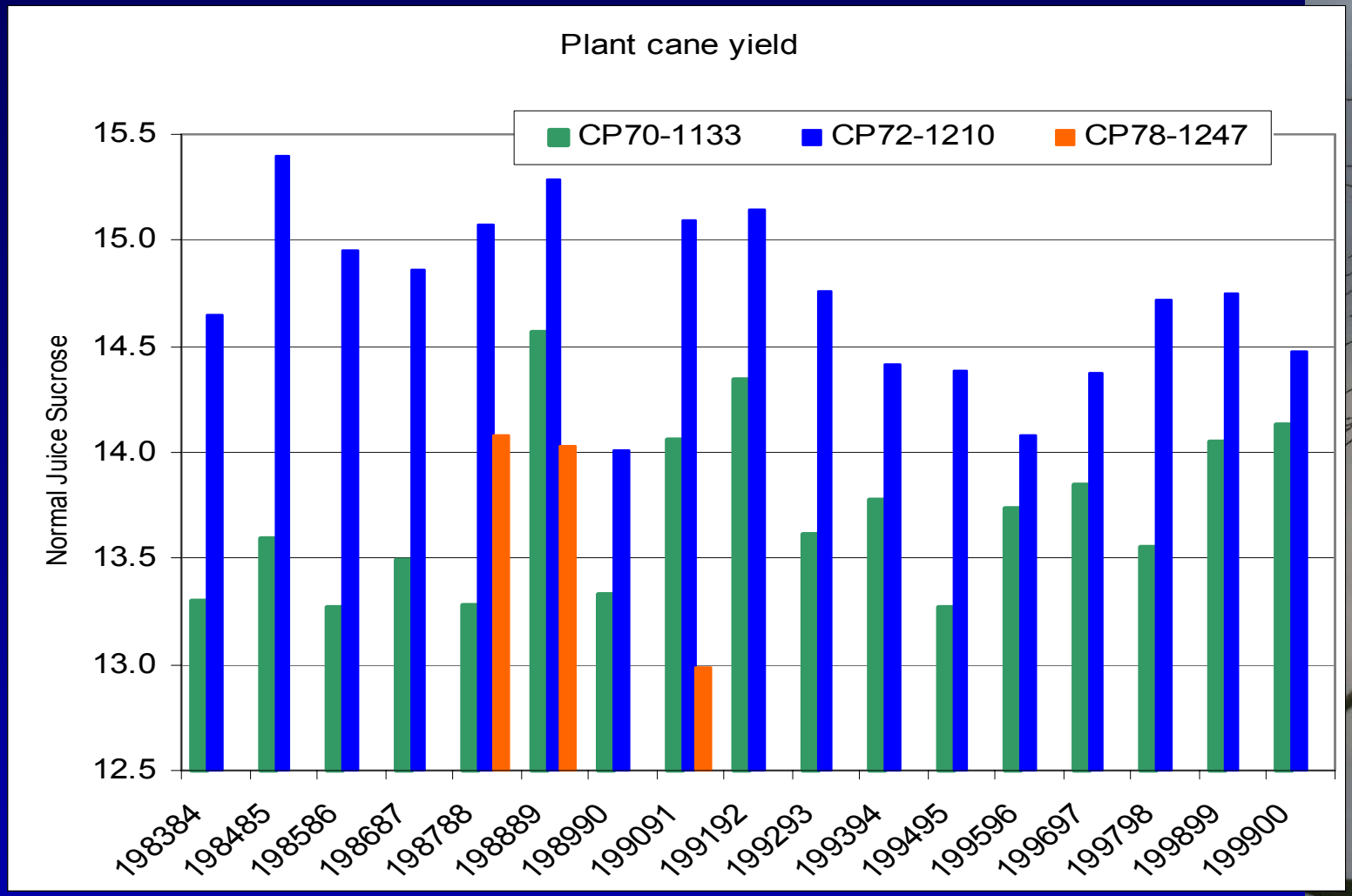
CP78-1247 - Sucrose



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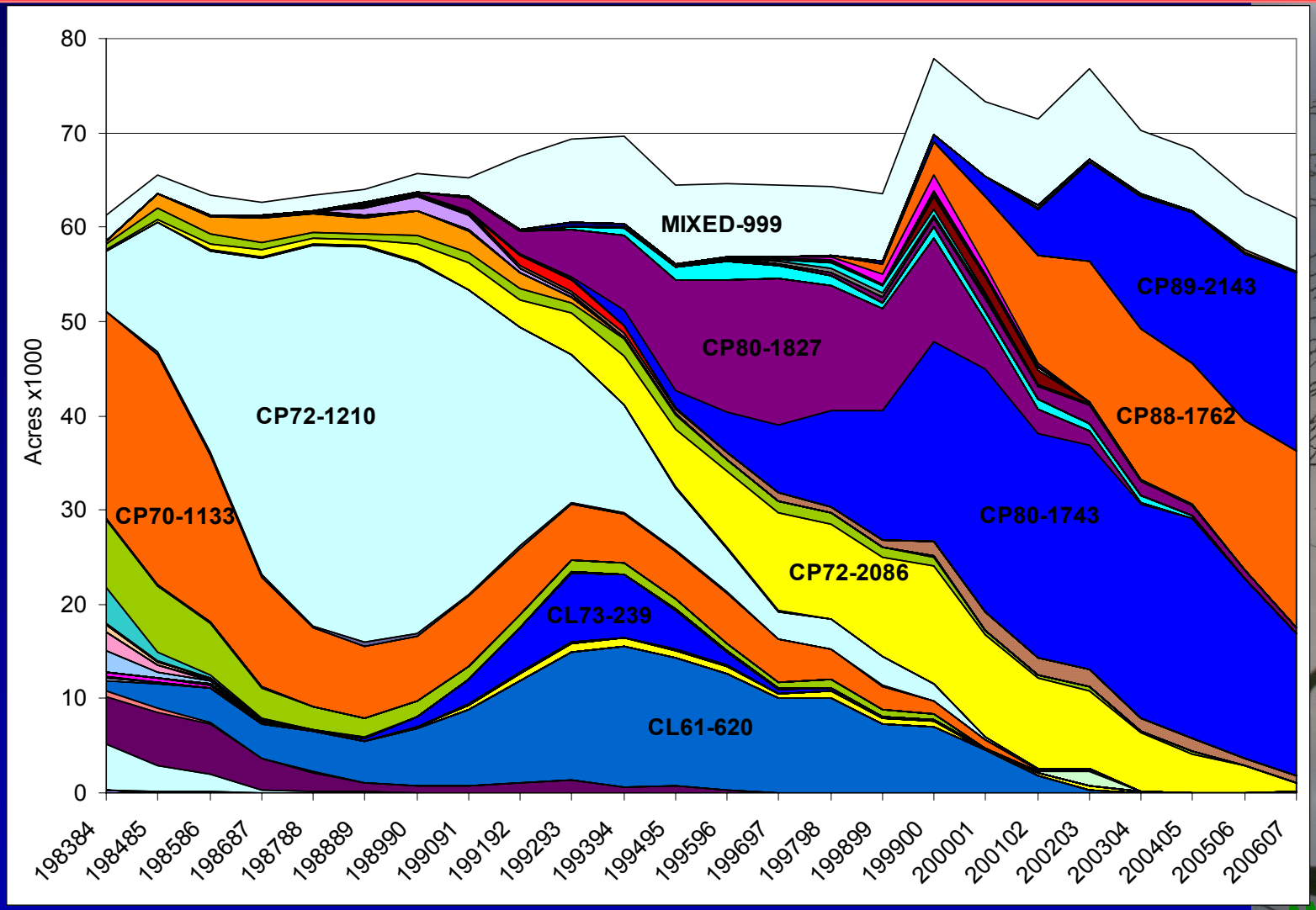
SCGC Cultivar Distribution



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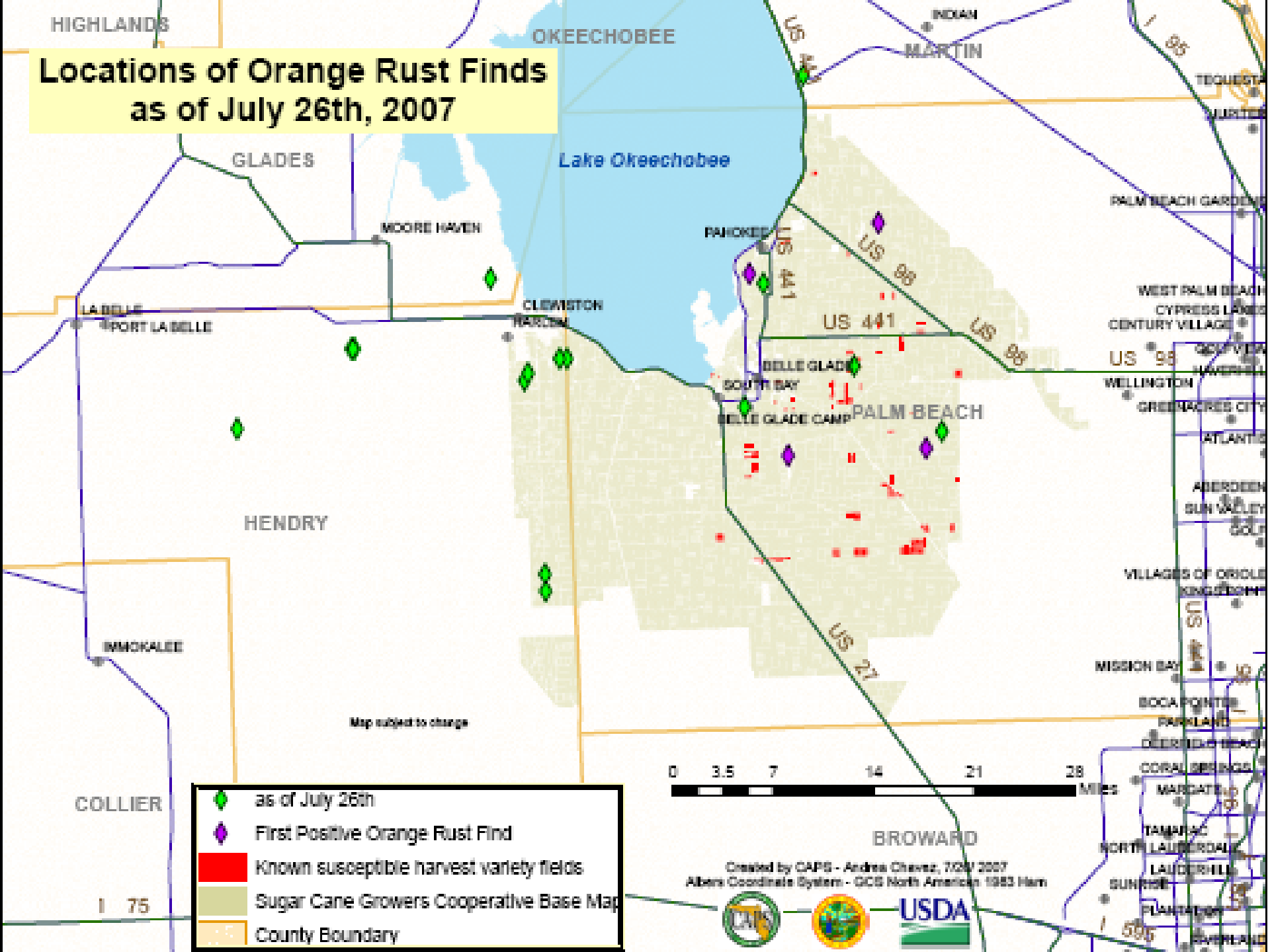
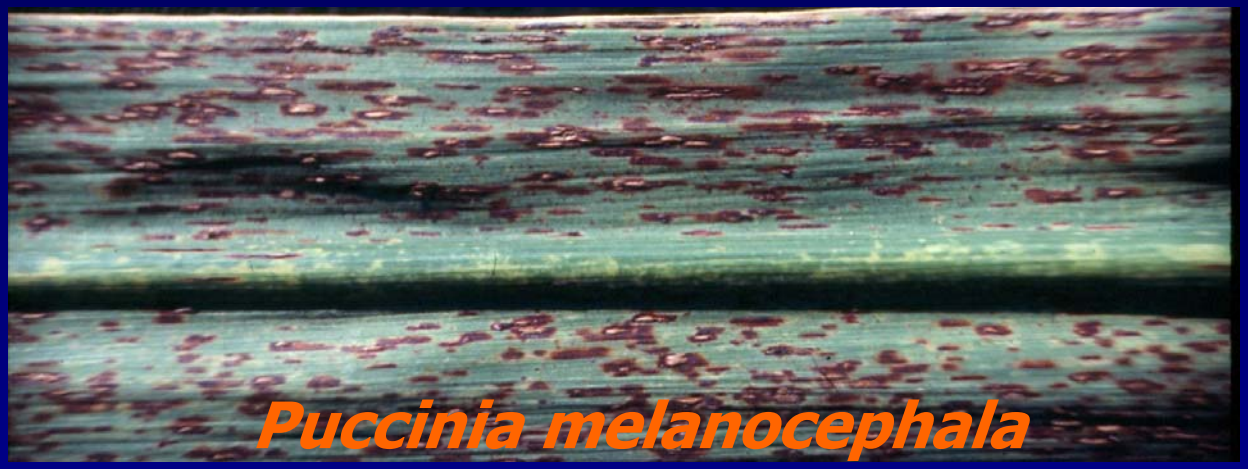
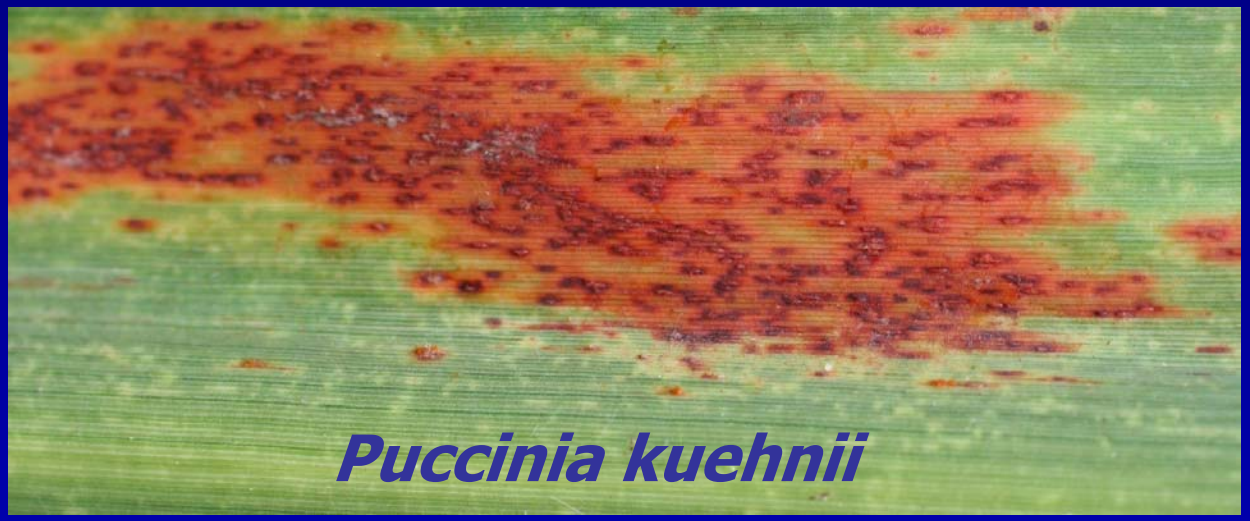
Orange Rust – Surprise!!!!

- First observed early June 2007
- Report confirmed July 17, 2007 by USDA/APHIS
- Completed CAPS survey of industry in July 2007
  - Generally distributed throughout FL industry
- Continental distribution unknown
  - Confirmed reports from Guatemala & Nicaragua
  - Still looking in other countries


Locations of Orange Rust Finds
as of July 26th, 2007
HIGHLANDS
OKEECHOBEE
INDIAN
MARTIN
GLADES
Lake Okeechobee
MOORE HAVEN
PAHOKEE
US 441
US 98
LA BELLE
PORT LA BELLE
CLEWISTON
BELLE GLADE
SOUTH BAY
BELLE GLADE CAMP
PALM BEACH
WELLINGTON
HENDRY
IMMOKALEE
US 27
Map subject to change
0 3.5 7 14 21 28
Miles
COLLIER
BROWARD
as of July 26th
First Positive Orange Rust Find
Known susceptible harvest variety fields
Sugar Cane Growers Cooperative Base Map
County Boundary
Created by CAPS - Andrea Chavez, 7/26/ 2007
Albers Coordinate System - GCS North American 1983 Him
CAPS
USDA
I 75

Symptom Comparison





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Orange Rust versus Brown Rust

- OR develops in warmer periods of the year
  - Beginning of grand growth period and persistent
- BR primarily cool season problem
  - Generally development declines prior to grand growth
- BR primarily decreases LAI development rate early
  - Recovery is possible, yield impacts remain
  - Most damaging on young plant cane – ratoons less impacted
- OR impacts leaf health later
  - Persistent through crop development
  - Similar reaction on all crop ages
- OR Final results undetermined

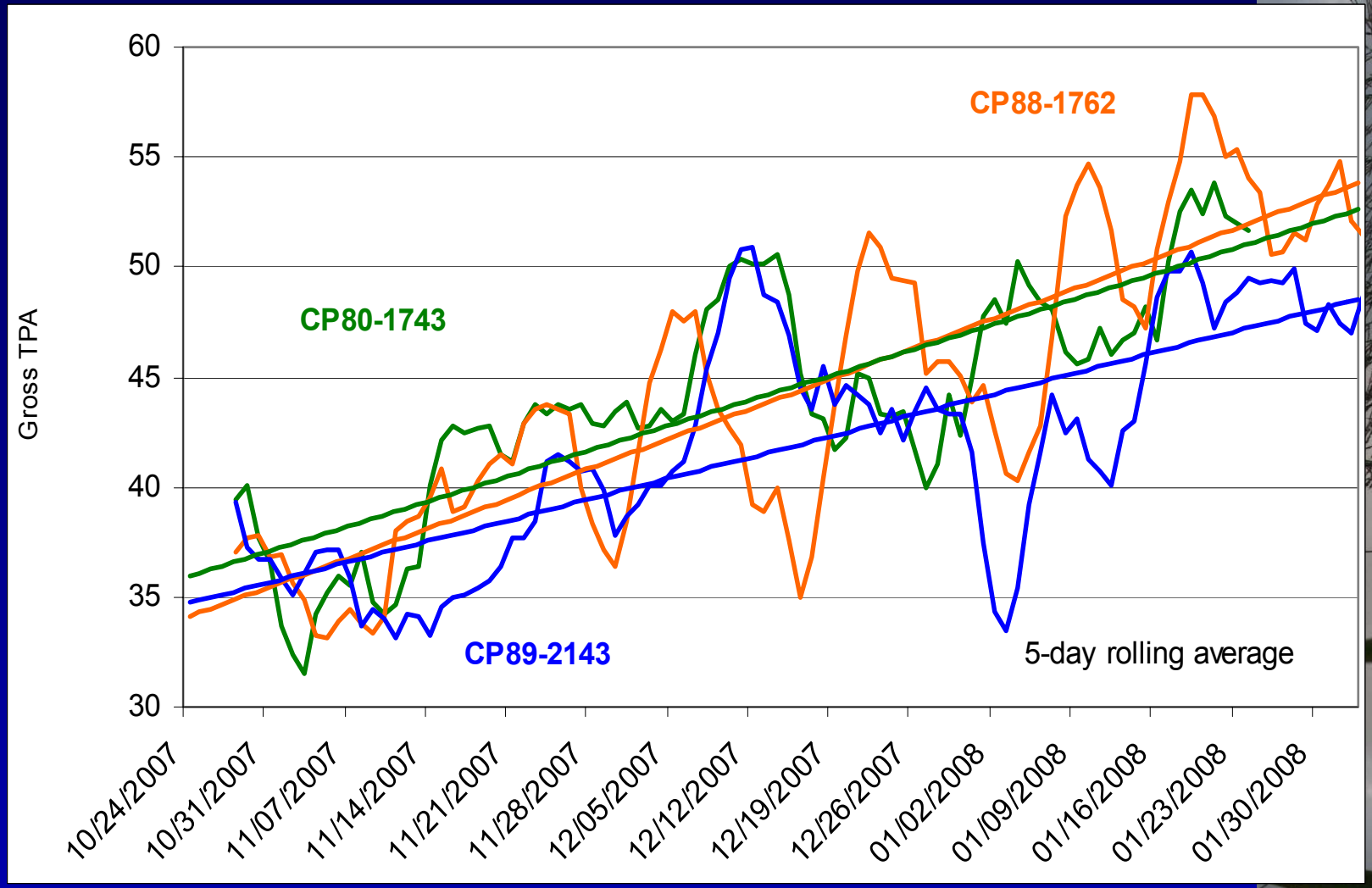
- Race changes reported for both species
- No understanding of genetic basis for resistance

Current status in field

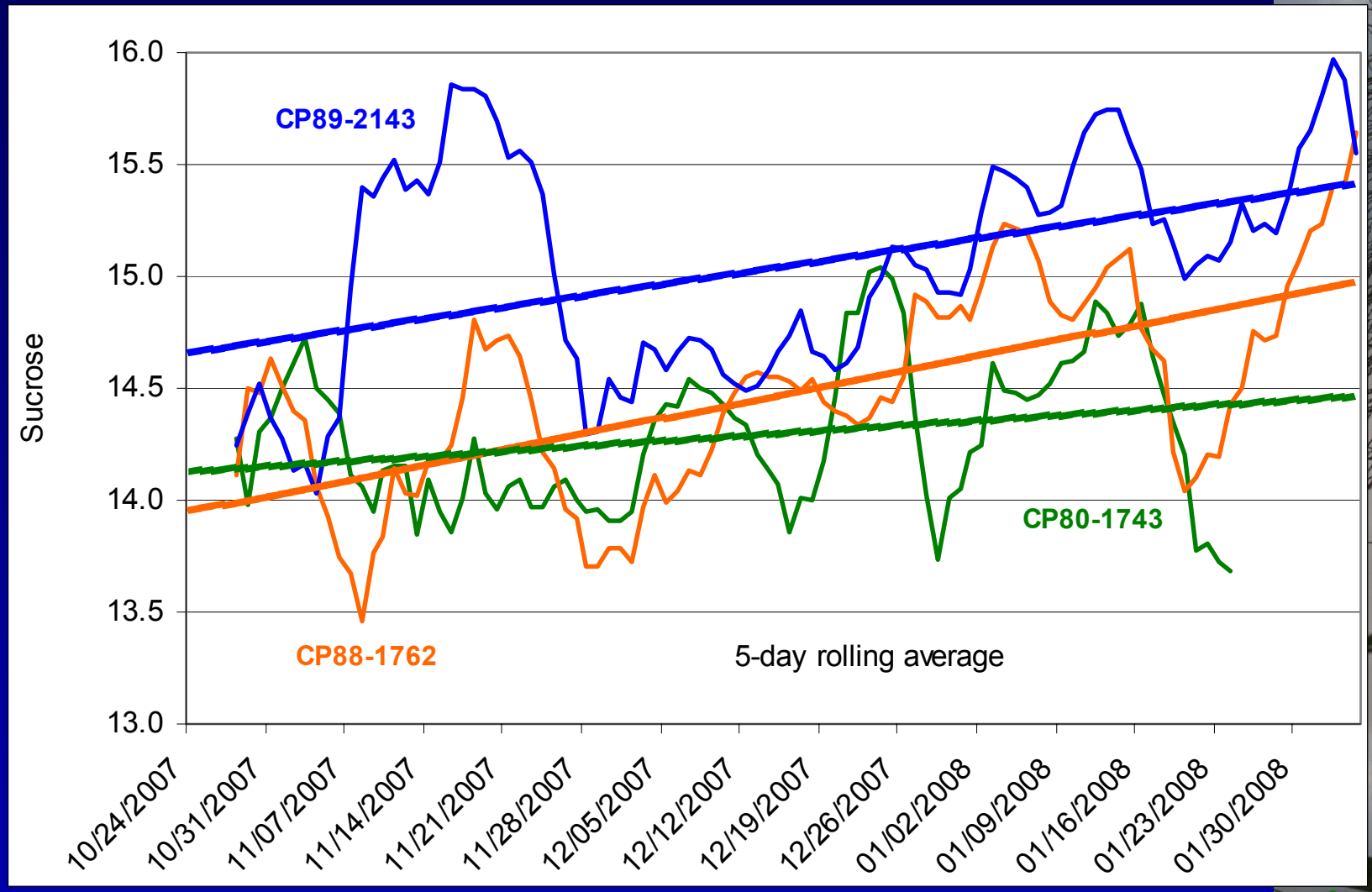
Current conditions

12/25/2007

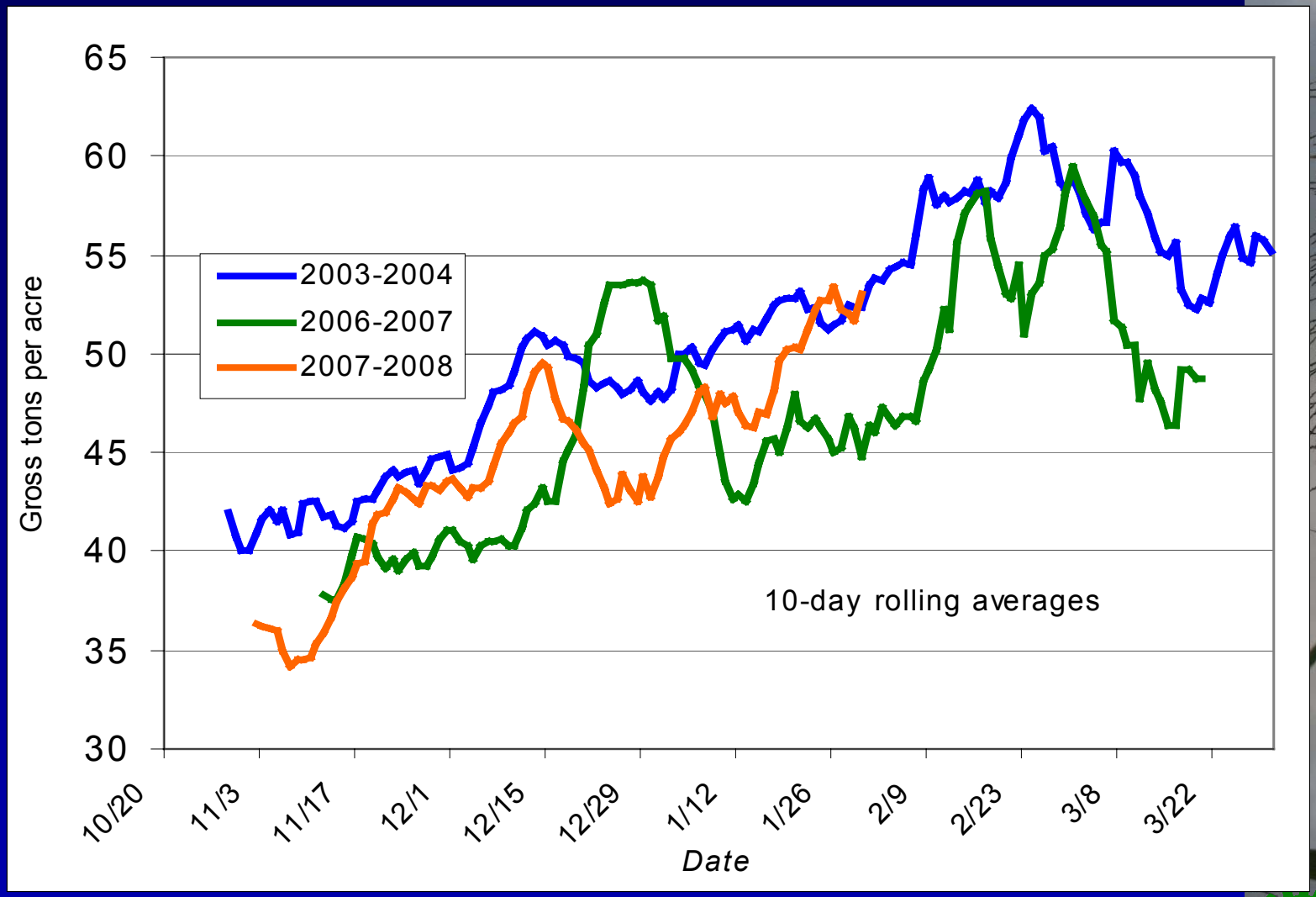
Gross Cane Yield



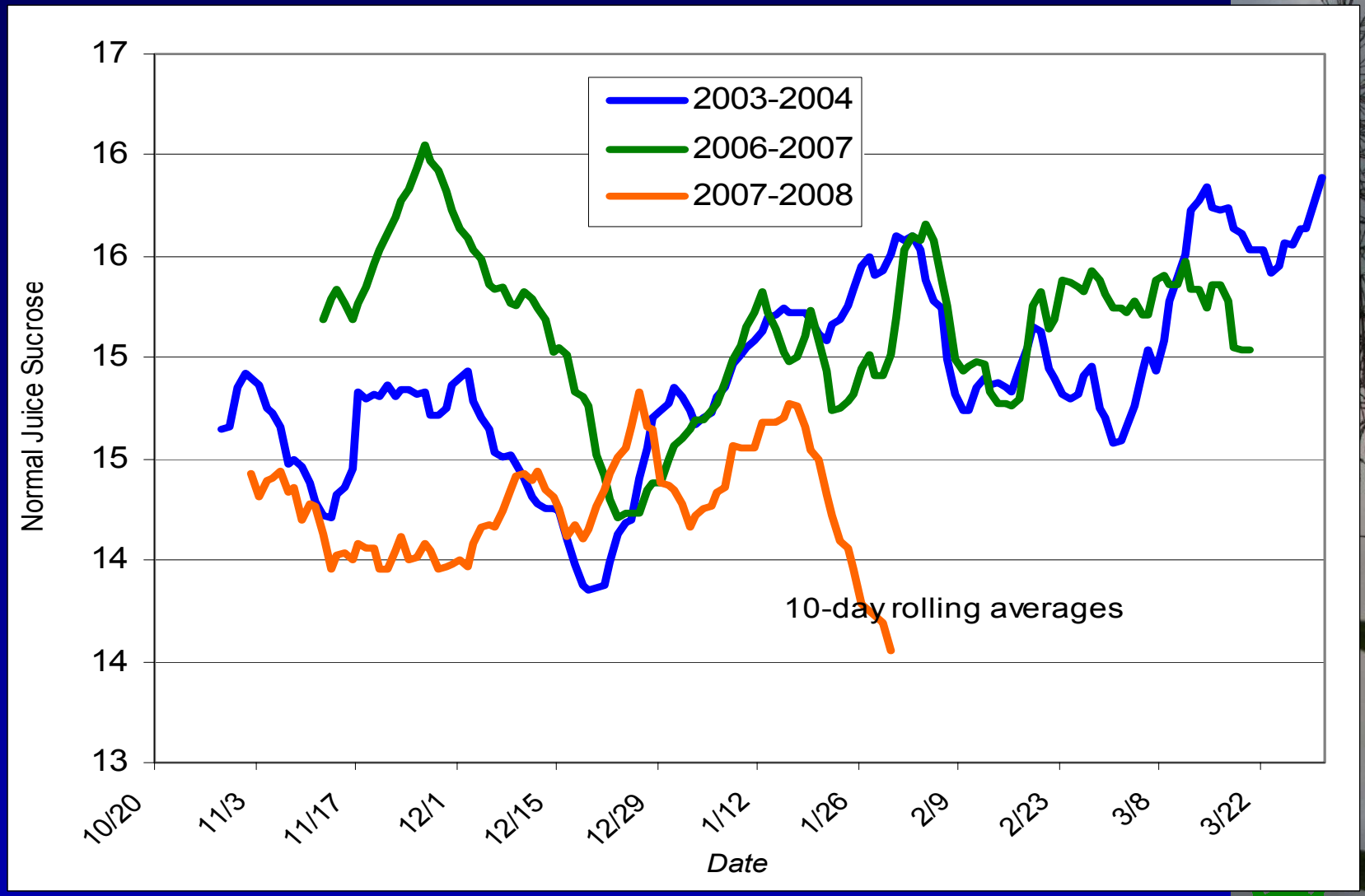
Sucrose


Sucrose
16.0
15.5
15.0
14.5
14.0
13.5
13.0
CP89-2143
CP80-1743
CP88-1762
5-day rolling average
10/24/2007
10/31/2007
11/07/2007
11/14/2007
11/21/2007
11/28/2007
12/05/2007
12/12/2007
12/19/2007
12/26/2007
01/02/2008
01/09/2008
01/16/2008
01/23/2008
01/30/2008

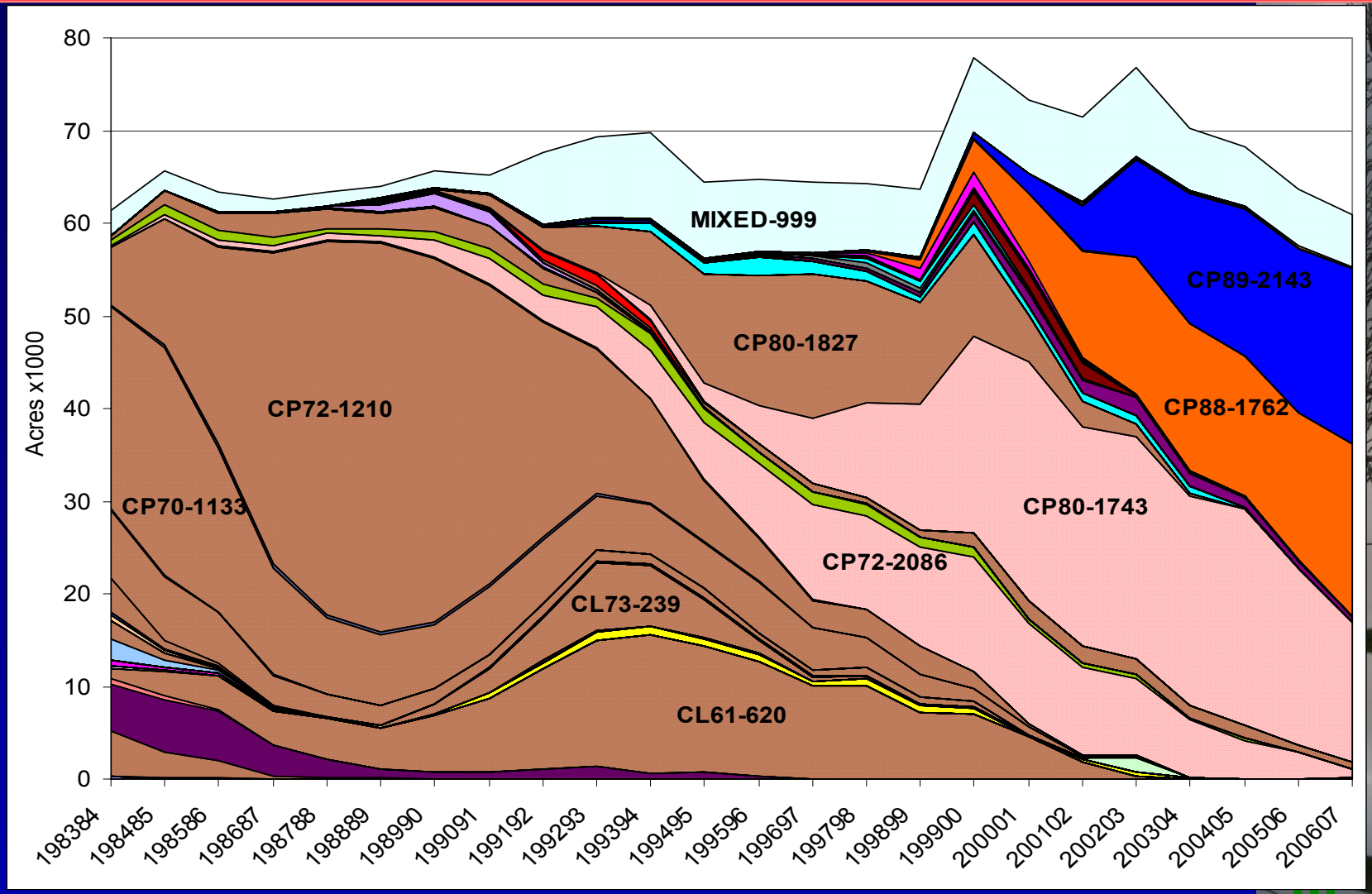
CP80-1743 Historical Comparison (GTPA)



CP80-1743 Historical (NJ Sucrose)



Cultivars Impacted by Rusts



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Preparing for the future

- **Must move out of CP80-1743**
  - **One current release (CP00-1101)**
- **Focus on understanding genetic basis for resistance**
  - **Identification of markers (associated genes) and genes (ESTs) for resistance**
- **Identification of parental lines for resistance**
  - **Development of reliable inoculation screening tools**
  - **Marker-assisted selection methodology**
- **Registration of fungicides for interim control**

Section 18 Application Status

- **Primary A.I.s Pyraclostrobin (Headline) & metconazole (Caramba)**
- **Final industry comments for submission due 2/5/2008**
- **Submitted to FDACS by 2/15/2008 for PREC recommendation**
- **Submission to EPA through FDACS &USDA planned by 3/1/2008**

Thank You


Geaux SEC!