

New this Season: Citrus Scion Selections from the USDA, ARS Citrus Scion Breeding Program

Matthew Mattia

Interim Citrus Scion Breeder
USDA, ARS Ft. Pierce, Florida



Searching for Trees of Commercial Value

- **ARS has been extensively screening their field populations** for fruit with commercial value. 24 preliminary selections have been made and will require additional evaluation.
- The primary effort is selecting varieties throughout the 2022-2023 season that have commercial potential.
- The USDA-ARS breeding program has approximately ~25k fruiting citrus varieties and hybrids across 2 locations



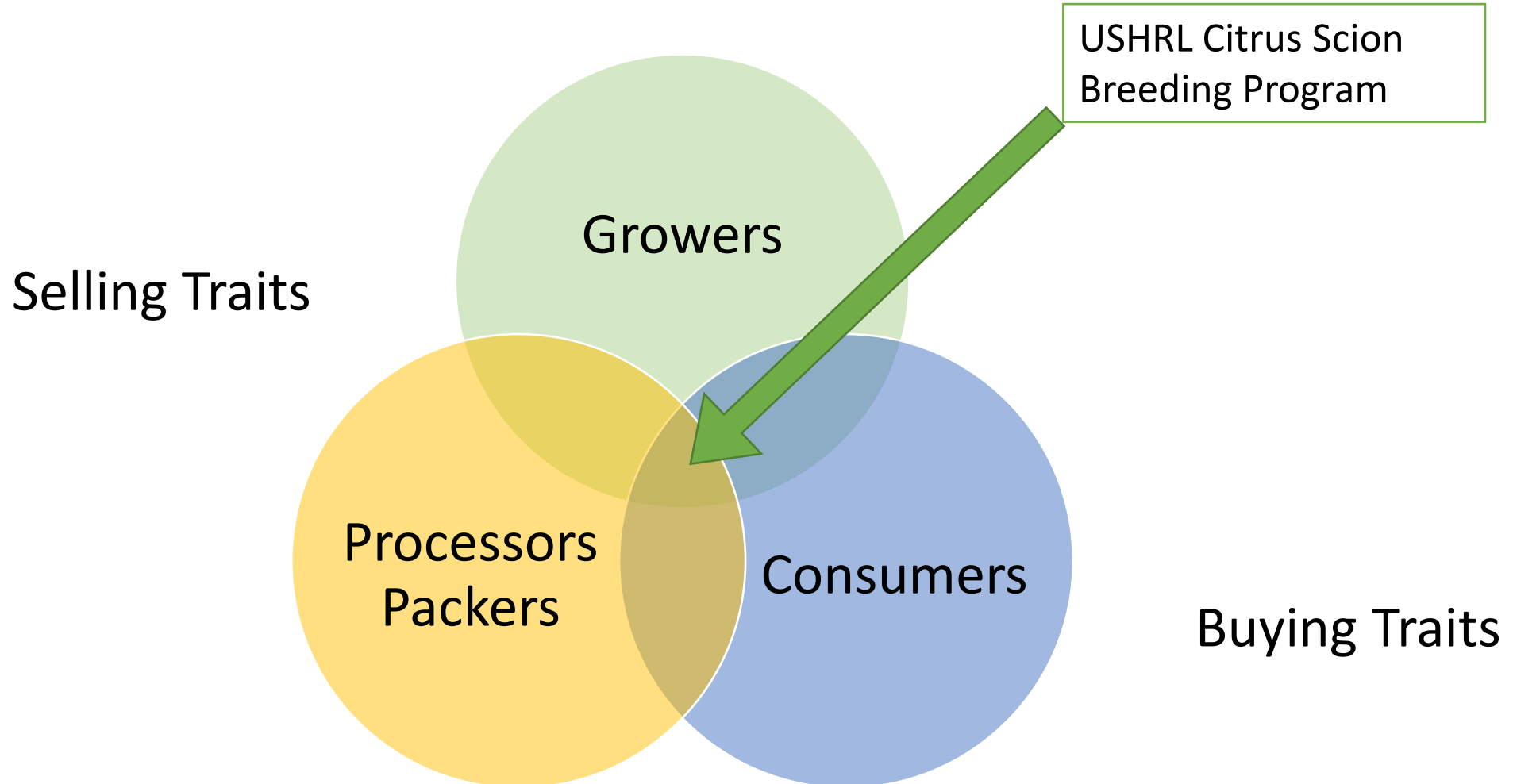
A. H. Whitmore Foundation Farm Groveland, FL



Picos Farm Ft. Pierce, FL

Citrus Breeding

“We want to create or discover varieties with traits that give you the ability to sell”



Breeding Program Focus

Overall Goal: Developing superior citrus varieties with traits that exceed current commercial expectations.

Program Objectives:

1. Sweet orange and sweet orange-like:

- Sweet orange flavor -HLB tolerance -High Brix -Low seeded
- Pasteurization -Yield -Firmness -Fruit size/shape

2. Fresh market mandarins:

- Excellent flavor -Yield -Easy to peel -Good texture -Low blemish
- HLB tolerance -Fruit size/shape -Color -Seedless/low seed

3. Grapefruit and grapefruit-like:

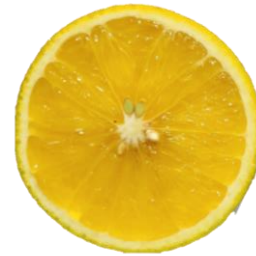
- Pink/red color -Yield -Seedless/low seed -Flavor -Low Bitterness
- Peel thickness -HLB Tolerance

New Varieties that are “like”

- True sweet oranges and grapefruit can ONLY be developed by **mutation breeding techniques** (irradiation, soma clonal variation, or natural mutation).

- Sweet orange-like cultivars are **mandarin hybrids** that closely resemble a sweet orange phenotype.

FF-5-3-108



'Donaldson'

- Grape fruit-like cultivars are **pummelo hybrids** that closely resemble a true grapefruit phenotype.

FF-1-83-179



Florida Red

What's new in 22 & 23

- We have made 24 new selections from mature material at both research farms.

Key Question: What do we have the can be of immediate interest to the industry and successful commercially?



The “Davis Family” Irradiated ‘Lee’ x ‘Nova’

- Fantastic Flavor! Brix from 12-14 peak season. Can be peeled.
- Medium fruit, Great Color, can be peeled. Possible dual purpose.
- We have made several selections from this population (low seeded, good fruit quality)
- Assessment for HLB to follow (trunk diameter may be the key for additional selections)

FF-1-21-30



FF-1-21-30

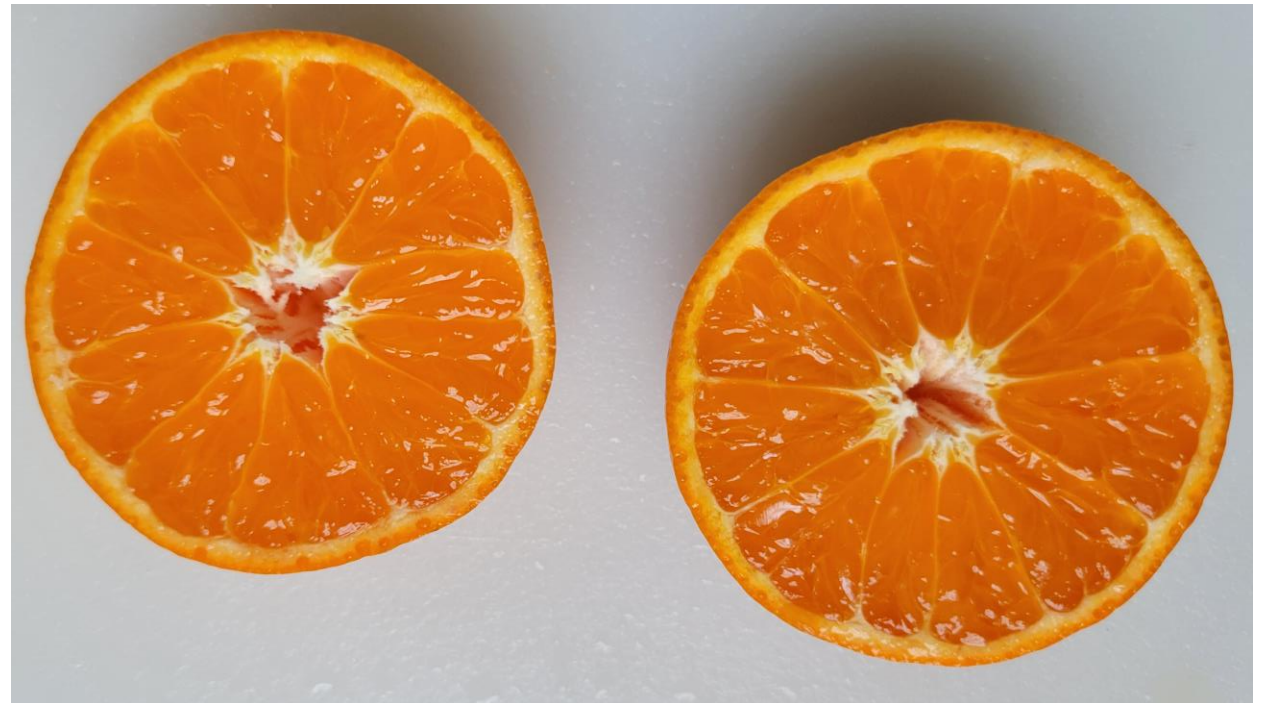


FF-1-21-65 (Low Seeded)



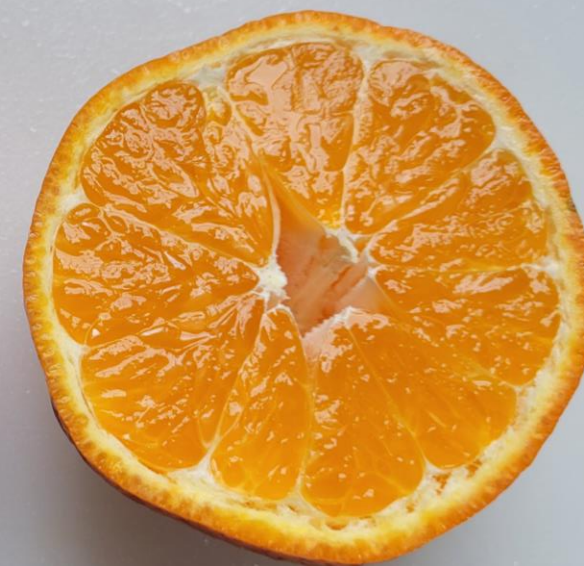
Matt's Favorite Mandarin Selection of 2022 FF-1-26-131 (FF-2-4-1 x FF-1.35.21)

- Excellent color, flavor, seedless and easy to peel. Matures in December.
- Some plugging and some stem dieback.
- Appears HLB tolerant.



FF-1-34-2 ('Fortune' x 'Kishu')

- Seedless
- Easy to peel
- Large fruit size 3.25in x 2.75in
- Nov-Dec?
- Good Flavor
- Tree has few HLB symptoms
- High yield dark green leaves
- Some dieback on own roots.
- Heavy crop in the 2022-2023 season



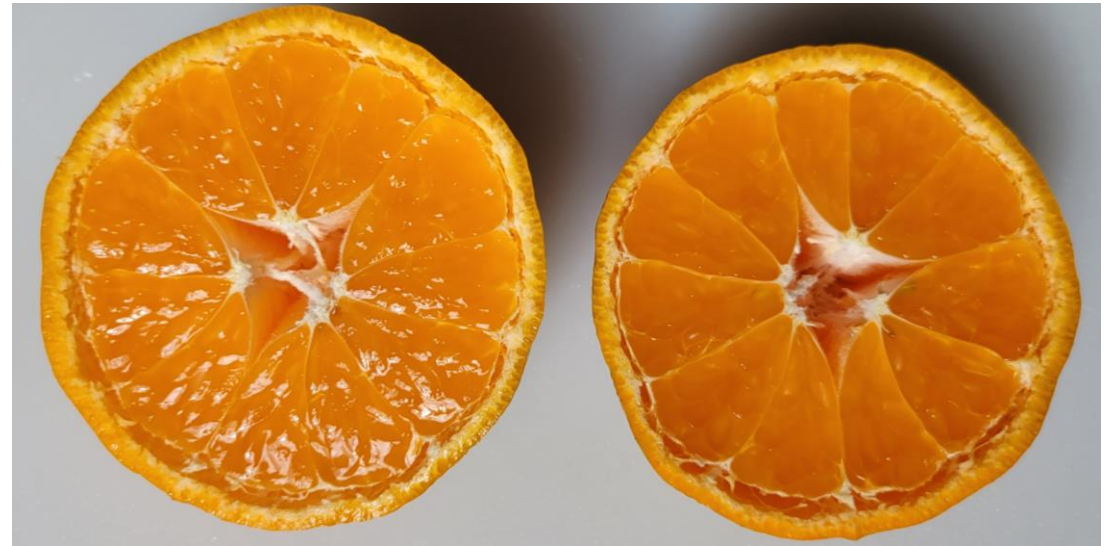
FF-5-3-108 Sweet Orange-like

- Complex Mandarin hybrid with Poncirus in background.
- Produces an early season orange-like fruit lower in acid than Hamlin.
- Field brix of 12.
- Appears to have good yield on own roots.
- Better color than Hamlin and sweet orange like flavor.



FF-5-6-16 (FF-5-51-2 x 'Kishu')

- Has very tiny seeds and aborts.
- Mandarin flavor.
- Good color.
- Easy to peel (satsuma-like)
- Own rooted tree shows some tolerance
- November or earlier



FF-1-43-1 Sweet Orange-like

- Female parent is sweet orange
- Orange-like flavor
- Tree appears tolerant to HLB
- Grafted on US812 rootstock
- Field Brix 10.2
- Early/Mid season
- Produced a heavy crop 2022-23 season
- Processing unknown



1-81-45 Grapefruit-like

- Pink fleshed grapefruit-like
- Exterior pink blush
- Tree appears to have some HLB tolerance
- Single tree has a good yield
- Planted on own roots 2.5 ft spacing
- ~11 seeds per fruit



Grapefruit Long Shots

- Observations have been made from the CRAFT project that Star Ruby has a greater level of tolerance than other Grapefruit mutants
- Our Star Ruby tree is dead.
- Are any of the grapefruits in our collection more tolerant than Star Ruby?

Henderson



Florida Red



Red Blush



Thank you

- Thanks to all of my lab members and the USHRL leadership team for giving me the opportunity to present today.
- Thank you to Florida Citrus Research Foundation for an invaluable resource: The Whitmore Foundation Farm.
- Thank you to CRDF and NVDMC.

Matthew Mattia

Email: Matthew.Mattia@usda.gov

Phone: 732-610-2880

