



# Rutgers University Fruit Breeding: A Pathway to Commercialization

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Adams County Nursery



# History of Breeding Program

- The Rutgers University Breeding program was started in 1907 by Dr. C.H. Connors
- 1920-1948 – Professor M.A. Blake
  - His varieties became the foundation of the peach industry in the mid-Atlantic area for 50 years
    - Golden Jubilee
    - Raritan Rose
    - Jerseyland
    - Triogem
    - Sunhigh
    - MA Blake



# History of Breeding Program

- 1948 – Dr. Frederick Hough took over the breeding program
- 1952 – Dr. Catherine Bailey
  - Dr. Hough focused on apple
  - Dr. Bailey focused on stone fruit



- Contributions:
  - Peach: Jerseyqueen, Jerseyglo, Autumnnglo and Encore
  - Flat Peach: Saturn
  - Apricots: Early Blush®, SunGem®, Orangered®



# History of Breeding Program

- 1948- Rutgers joined the PRI Apple Breeding Collaboration
  - Included: Purdue University, Rutgers University and the University of Illinois
  - Focused on the breeding of scab resistant apple varieties
  - Most significant accomplishments:
    - Pristine
    - Enterprise
    - Goldrush
    - CrimsonCrisp



Dan Dayton, Jules Janick, Ed Williams, Fred Hough, and Ralph Shay

# History of Breeding Program

- 1961 – Babygold #5 and Catherina were introduced

by Drs. Bailey and

Hough

- These varieties became the backbone of the processed peach industry in Michigan, Pennsylvania, New York and Ontario and are still important varieties today



# History of Breeding Program

- 1982-1986 – Dr. Shawn Mehlenbacher
  - Shawn currently leads hazelnut breeding program at Oregon State University
- 1989 – Dr. Joseph Goffreda began his tenure as tree fruit breeder at Rutgers and continues in this role today



# Current Program Direction

- Dr. Joe Goffreda
  - Current Director of the Rutgers Fruit and Ornamental Research and Extension Center in Cream Ridge, NJ
  - Associate Professor of genetics and plant breeding at Rutgers University



# Current Program Direction

- Dr. Goffreda was fortunate to have two critical components of a breeding program in place at the start of his career at Rutgers.
  1. A very diverse collection of germplasm from around the world
    - Peach and Apricot – Uzbekistan, Turkmenistan, China and Japan
    - Apple – Kazakhstan
  2. An experienced technician program assistant
    - Anna Voordeckers worked with Drs. Bailey and Hough Beginning in 1965 and continues in that role today after 47 years of service





# Current Program Direction

## “Serving the Fringes”

- Purpose of current breeding program:
  - Develop apricots for areas that cannot typically grow apricots
  - Breeding apples for areas with a high threat of apple scab and fire blight
  - Developing peach varieties for regions with high humidity and severe bacterial spot pressure
- Creating niche varieties for the direct market/farmers market growing community



# Commercial Relationship

- **2006** – Adams County Nursery entered into a formal relationship with Rutgers University Office of Technology Commercialization



- A defined collaboration with specific roles and responsibilities
- New selections fall within the guidelines of the agreement when propagative material is transferred to ACN

# COLLABORATION

## Responsibilities of Commercial Partner:

- Propagation of test trees
- Establishment of a group of industry testers to establish trial plantings
- Completing MTAs for all distribution of test material
- Distribution of test trees
- Establish selections in trial plantings under control of nursery
- Evaluation and reporting back to breeder
- Financial obligation for costs of patent and trademark applications
- Virus Certification through National Clean Plant Network with associated costs
- Establishment of foundation grade mother blocks for propagation
- Marketing and Commercialization of new varieties
- Collection of tree royalties and production royalties
- Annual reports and accounting back to Rutgers Office of Technology Commercialization
- Entering into Sub-license agreements

# Sub-Licensing

- Primary responsibility to sub-license in the US and internationally
- Sub-licensees required to report back to ACN
- A complied annual report is provided to Rut
- Current U.S. sub-licensees :
  - Dave Wilson Nursery – Modesto, California
  - Fowler Nurseries, Inc – Newcastle, California
  - Brandt's Fruit Trees, Inc – Yakima, Washington
  - Van Well Nursery – Wenatchee, Washington
  - Cameron Nursery, LLC – Eltopia, Washington
  - Cumberland Valley Nurseries, Inc – McMinnville, Tennessee



# Sub-Licensees in the US and Canada



# Sub-Licensing

- Vineland Research and Innovations Center (VRIC)



- Rights for all transferred stone fruit varieties to be licensed in Canada by VRIC
- Selections available to Canadian growers beginning this year
- Responsibilities shared between VRIC and ACN

# International Sub-Licensing

- **AIGN - Associated International Group of Nurseries**
- Agreement with AIGN had been established to create a pathway for testing, plant breeders rights and licensing worldwide.
- Members from Europe, Australia, New Zealand, South Korea, Chile, Argentina, Uruguay, South Africa, and China





# New Rutgers Peach Introductions



# Desiree™

(NJ 350 ctlv.) PP# 19,382

**This early season peach was selected for its exceptional fruit quality.**

**Fruit ripens in early July in south central Pennsylvania or about with PF#1 Flamin' Fury**



# Gloria™

(NJ 351 ctlv.) PP# 18,224

Gloria is probably the most exciting new variety I have seen from this program.

It is currently being planted in most large commercial orchards in New Jersey.

Fruit is very large, firm and maintains it's firmness on the tree for 10-14 days.



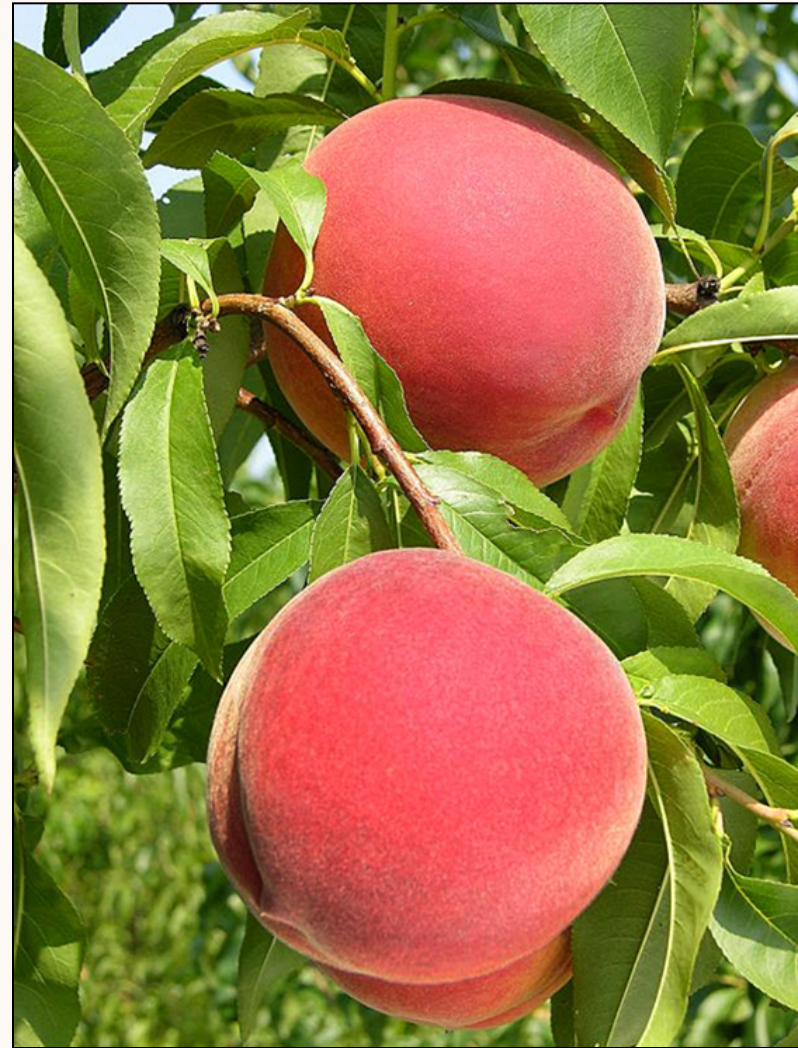
# Messina<sup>TM</sup>

(NJ 352 ctlv.) PP# 18,091

**A mid to late season  
yellow freestone with  
exceptional size and color**

**Very resistant to bacterial  
spot**

**Messina is rated very high  
in overall fruit quality**



# TangOs®

(NJF 16 ctlv.) PP# 18,997

**One of the four flat or donut peaches introduced by the Rutgers Program in the past six years**

**The name TangOs® was chosen for the tangy flavor profile. The variety has become an interesting addition for growers serving the niche markets and direct market sector**



# BuenOs<sup>TM</sup>

(NJF 15 ctlv.) PP#20,168

**BuenOs® is another of the donut peaches introduced in recent years.**

**The fruit is very large, sub-acid with firm yellow flesh.**

**Ripening just before Redhaven, this variety is an excellent niche variety for the retail/farm market industry**



# Scarlet Rose<sup>TM</sup>

(NJ 355 ctlv.) PPAF

- White fleshed clingstone.
- Excellent flavor and texture.
- Highly productive.
- Fruit stays firm on tree for about 2 weeks after maturity.



- Ripens less than a week before Red Haven
- Some susceptibility to bacterial leaf spot

# August Rose<sup>TM</sup>

(NJ 356 ctlv.) PPAF



- Very attractive.
- Late season white peach (+24d)
- 60-90% medium red on cream.
- 2 <sup>3</sup>/<sub>4</sub> - 3 inches in diameter.

- Excellent firmness.
- Low acid flavor.



# July Rose<sup>TM</sup>

(NJ 354 ctlv.) PPAF

- Very attractive.
- Excellent firmness.
- Sweet flavor.
- Early season white peach (-14d).



- Tolerant to bacterial leaf spot.
- Melting clingstone.



# Avalon™

(NJ 101 ctlv.) PPAF



- Early yellow nectarine (-12d).
- Very attractive.
- 90-95% glossy red on yellow.
- Good firmness.

- Sizes fairly well for the season.
- Clingstone with a melting texture.
- Normal acid, but very sweet.



# Apricot Breeding Program

Up until now, we have not had much activity in the apricot program.

In spring 2013 we will have the first trees of ten new selections go out into trials.



# Rutgers Scab Resistant Apple Breeding



Budwood of elite selections was moved from Rutgers to Adams County Nursery in 2009

Planted into trials spring 2011

Fruit evaluations beginning 2013 season



# USDA-ARS/Rutgers/ACN Post Harvest Research Collaboration



**Jon Clements-U Mass**  
**Win Cowgill-Rutgers**  
**Jerry Frecon-ACN**  
**Joe Goffreda-Rutgers**

**The USDA-ARS Post  
Harvest Group**  
**Beltsville, Maryland**



# Future Outlook

- **Focus on commercial peach and nectarine varieties with high fruit quality and resistance to bacterial leaf spot. Currently over 50 numbered selections in the program**
- **Evaluate apricot collection with the focus on selections for regions where apricots are difficult to grow. Currently ten selection under test**
- **Continue evaluations on collection of 23 scab resistant apple cultivars with emphasis on improved varieties for the commercial grower with an emphasis on the direct market retail market grower.**

# Thank You!