# Strawberry Variety Trial 2016-17



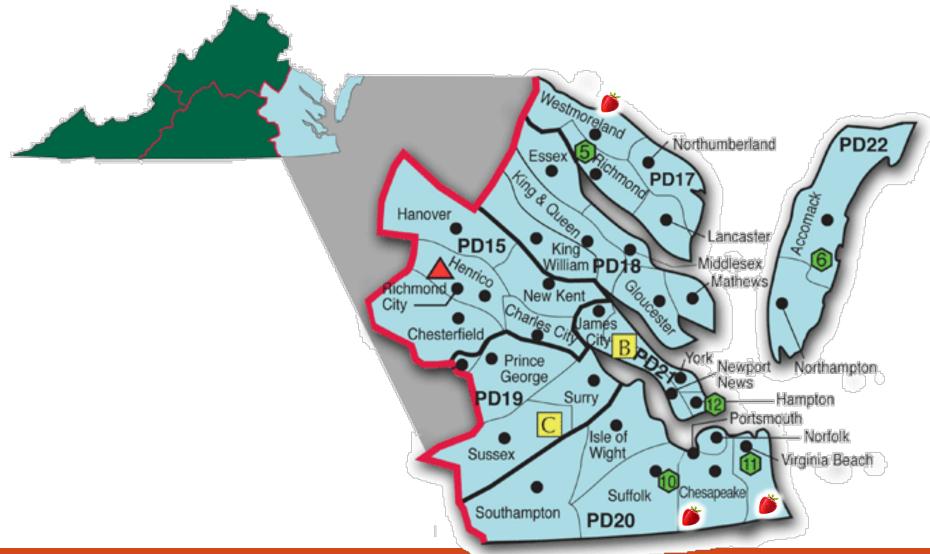
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### 2013-14 growing season

### **Southeast District**





### Review: Varieties evaluated in 2013-14 growing season

Variety	Туре	Where from?	Variety	Туре	Where from?
1. Albion	Day neutral	UC Varieties	7. Strawberry Festival	June- bearing	U. Florida
2. Benicia	June-bearing		8. Florida Radiance		U. Florida (2008)
3. Camarosa	June-bearing		9. Sweet Charlie		U. Florida
4. Camino Real	June-bearing		10. Winterstar		U. Florida (2011)
5. Chandler	June-bearing		11. Treasure		Florida, Private Breeder Peggy
6. San Andreas	Day neutral		10 FloverFoot		Chang, Naples
			12. FlavorFest		USDA Beltsville, MD

# Summary from 2013-14 season



- Camino Real, Chandler, Camarosa, and Benicia were the top yielding cultivars. Camino Real yield was consistently the best at all three locations.
- Camino Real and Benicia had larger fruits than Chandler, Camarosa, and Sweet Charlie.
- Sweet Charlie and Flavorfest were amongst the sweetest berries, but Sweet Charlie yielded high only at single location. Flavorfest may be a good alternative cultivar to Sweet Charlie in terms of sweetness.
- Both Benicia and Camino Real were less sweet compared to Chandler and Camarosa.



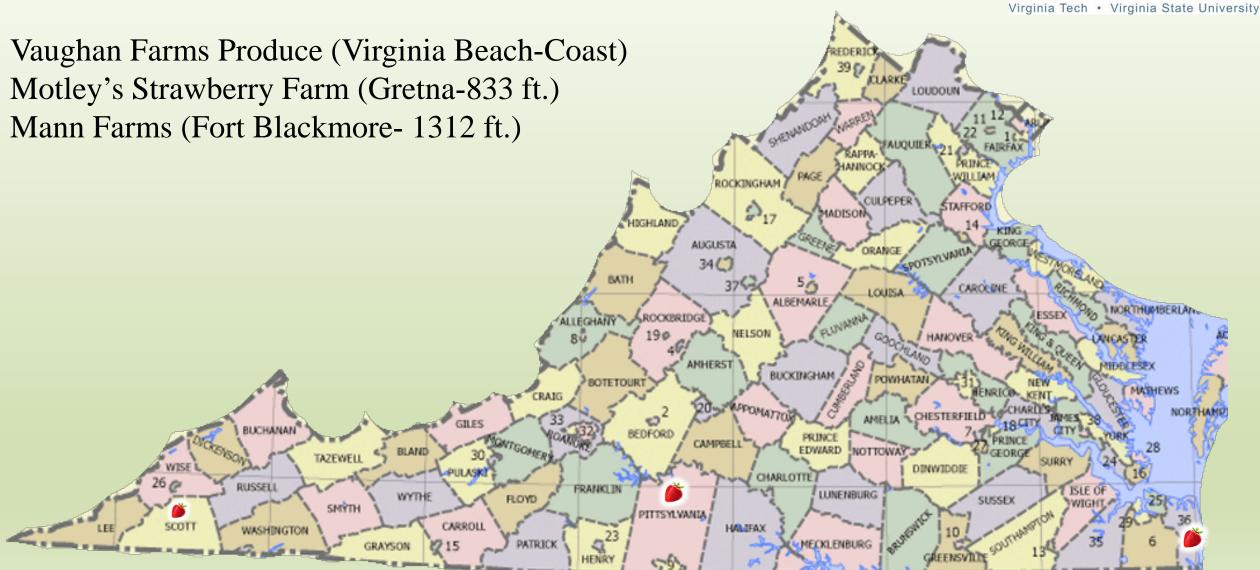


To identify strawberry cultivars that would be commercially suitable for growers in Virginia, utilizing current grower practices in an annual plasticulture production system.



# Participating farms 2016-17 season:





### Varieties evaluated in 2016-17 growing season:



Variety	Year of Release	Location
1. 8-8-6	Unreleased	Rutgers U.
2. 09-2-1	Unreleased	Rutgers U.
3. Benicia	2010	U. California
4. Cabrillo	2010	U. California
5. Camarosa	1992	U. California
6. Camino Real	2001	U. California
7. Chandler	1983	U. California
8. Flavorfest	2012	USDA Beltsville, MD

Variety	Year of Release	Location
9. Merced	2014	U. California
10. NCS 10-038	Unreleased	North Carolina State U.
11. NCS 10-156	Unreleased	North Carolina State U.
12. Ruby June	2014	Lassen Canyon Nursery
13. Lucia	2014	Lassen Canyon Nursery
14. Rutgers Scarlet	2015	Rutgers U.
15. Sweet Charlie	1992	U. Florida



# Nursery supply source

Chandler, Camarosa, Sweet Charlie, Flavorfest, Camino Real, and Benicia --→McNitt Growers, Carbondale, IL.

Ruby June, Lucia, Cabrillo, and Merced→ Carther Plants, Ontario, Canada.

NCS-038 and NCS-156 advanced selections → NC State University.

09-2-1, 8-8-6, and Rutgers Scarlet→ Rutgers University. The Rutgers plant material was evaluated only at Vaughan Farms due to its late procurement.



# **Approach**

- Randomized Complete Block Design
- 4 Replicates
- 10 plants per replicate
- 15 varieties at Vaughan Farms
- 12 varieties at Motley's Farm and Mann Farms

### **Data Taken**

- Plant health ratings
- Stand count
- Disease incidences
- Crop yield
- Fruit parameters at one site:
  - Fruit Size
  - Fruit Firmness
  - Berry Sugar Content

### Initial Activities at Vaughan Farms.

- 4 Sept. Preplant fertilizer at 60 lbs/A nitrogen
- 11 Sept. PicClor60 at 140 lbs/A.
- 4 Oct. Transplanting of strawberry plugs
- 8 and 9 Oct. Hurricane Matthew
- 14 Oct. Firming transplants back in planting holes
- 17 Oct. Replacing the missing plug plants from planting hole

		Marketable Yield	
		(7 Apr 17 through 13 Jun 17)	Letter Group
Obs	Variety		LSD, alpha =
		lbs/plant	0.05
1	NCS-038	1.2	A
2	Benicia	0.9	В
3	Chandler	0.9	В
4	Camino Real	0.8	BC
5	NCS-156	0.7	BCD
6	Merced	0.6	CDE
7	Ruby June	0.6	DE
8	Rutgers 8-8-6	0.5	DE
9	Rutgers Scarlet	0.5	DE
10	Camarosa	0.5	DE
11	Flavorfest	0.5	DE
12	Cabrillo	0.4	EF
13	Sweet Charlie	0.3	FG
14	Lucia	0.2	FG
15	Rutgers 9-2-1	0.2	G



Highest and superior yield over Chandler: NCS-038.

Benicia, Camino Real, NCS-156 yielded comparable to Chandler.

Ruby June yields were less than Chandler, but comparable to Camarosa.

Lowest yield: Sweet Charlie, Lucia, Rutgers 9-2-1.

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		Total Yield	T C
Obs	Variety	(7 Apr 17 through 13 Jun 17)	Letter Group
OUS	variety		LSD, alpha =
		lbs/plant	0.05
1	NCS-038	1.7	A
2	Benicia	1.5	AB
3	Chandler	1.4	В
4	Camino Real	1.3	BC
5	NCS-156	1.2	BC
6	Merced	1.0	CD
7	Flavorfest	1.0	CD
8	Rutgers Scarlet	1.0	CD
9	Rutgers 8-8-6	1.0	CD
10	Ruby June	0.9	D
11	Comoroso	0.0	D
11	Camarosa	0.9	D
12	Cabrillo	0.9	D
13	Lucia	0.7	DE
14	Sweet Charlie	0.5	Е
15	Rutgers 09-2-1	0.4	Е



Highest and superior yield over Chandler: NCS-038.

Benicia, Camino Real, NCS-156 yielded comparable to Chandler.

Ruby June yields were less than Chandler but comparable to Camarosa.

Lowest yield: Sweet Charlie, Lucia, Rutgers 9-2-1.

Obs	Variety	Total Soluble Solids	Letter Group
Obs	variety	°Brix	LSD, alpha = $0.05$
1	RS 9-2-1	9.4	A
2	Lucia	8.7	В
3	RS-886	8.5	BC
4	Rutgers Scarlet	8.4	BC
5	Sweet Charlie	8.0	CD
6	NCS-156	7.8	DE
7	Ruby June	7.7	DE
8	Camarosa	7.5	DE
9	Flavorfest	7.4	EF
10	Merced	7.4	EF
11	Chandler	7.2	EF
12	NCS-038	6.9	FG
13	Cabrillo	6.6	GH
14	Camino Real	6.3	GH
15	Benicia	6.1	Н



Rutgers Selection 9-2-1, Lucia, are both sweeter than Sweet Charlie

Rutgers 8-8-6, Rutgers Scarlet, NCS-156, Ruby June, Camarosa comparable to Sweet Charlie

TSS in Merced, Flavorfest, NCS-38, Camarosa, Ruby June, were comparable to Chandler

Benicia, Camino Real, Cabrillo had the lowest TSS.

Obs	Variety	Fruit Size		er Group , alpha =
		g/fruit		0.05
1	Benicia	25.4		A
2	Cabrillo	23.3	1	AB
3	Lucia	21.3		BC
4	Merced	20.7		BCD
5	NCS-038	20.0		CDE
6	Camino Real	19.5		CDEF
7	Camarosa	19.3		CDEF
8	Ruby June	18.3		DEFG
9	Flavorfest	17.2		EFGH
10	Rutgers Scarlet	16.8	+	FGH
11	Rutgers 09-2-1	16.3		GHI
12	NCS-156	16.3		GHI
13	Chandler	16.1		GHI
14	Rutgers 8-8-6	14.6		Н
15	Sweet Charlie	13.8		I



Benicia and Cabrillo had larger fruits than Camarosa.

Sweet Charlie had the smallest fruit size not different from Rutgers 8-8-6, Chandler, NCS-156, and Rutgers 9-2-1.

Obs	Variety	Firmness (kg)	Letter Group
1	Cabrillo	0.29	A
2	Camarosa	0.27	AB
3	Lucia	0.24	ВС
4	Rutgers 09-2-1	0.24	BC
5	Merced	0.23	BCD
6	Camino Real	0.22	CD
7	Benicia	0.22	CD
8	NCS-038	0.21	CDE
9	Ruby June	0.21	CDE
10	NCS-156	0.20	CDE
11	Sweet Charlie	0.19	DEF
12	Rutgers 8-8-6	0.19	DEF
13	Rutgers Scarlet	0.18	EF
14	Flavorfest	0.16	EF
15	Chandler	0.15	F



Most firm: Cabrillo and Camarosa

Least firm: Chandler, not significantly different from Flavorfest and Rutgers Scarlet.

Obs	Variety	Yield	Sweetness	Firmness	Size
1	NCS-038	+	-	0	+
2	Benicia	+	-	0	+
3	Chandler	+	0	-	0
4	Camino Real	+	-	0	+
5	NCS-156	+	+	0	0
6	Merced	0	0	+	+
7	Ruby June	0	+	0	0
8	Rutgers 8-8-6	0	+	-	-
9	Rutgers Scarlet	0	+	-	0
10	Camarosa	0	0	+	+
11	Flavorfest	0	0	-	0
12	Cabrillo	-	-	+	+
13	Sweet Charlie	-	+	-	-
14	Lucia	-	+	+	+
15	Rutgers 9-2-1	-	+	+	0



Variety	Liked	Disliked
886	_	-
0921	3	0
Benicia	0	4
Cabrillo	1	1
Camarosa	2	0
Camino Real	1	1
Chandler	3	0
Flavorfest	2	1
Lucia	1	1
Merced	0	3
NCS-038	0	2
NCS-156	1	2
Ruby June	1	1
Rutgers Scarlet	0	3
Sweet Charlie	1	1

# 8-8-6











# Benicia



- Moderate to high plant vigor with an open canopy.
- Good disease profile except susceptible to Verticillium wilt (*Verticillium dahliae*) and moderately susceptible to Anthracnose crown rot (*Colletotrichum acutatum*).
- Fruit is large and firm, and plant is a heavy bearer. In California, fruits were produced earlier in the season than 'Camarosa'.
- Good for fresh market, processing, and home gardens.



# **Cabrillo**



- Day-neutral (ever-bearing) variety.
- Moderate to high plant vigor with an open canopy.
- Moderately susceptible to powdery mildew, anthracnose, Verticillium wilt, Phytophthora crown rot, and common leaf spot.
- Fruit is large, firmer.
- Good for fresh market, processing, and home gardens.

### Camarosa



- Moderate to high plant vigor.
- Good disease profile except susceptible to Verticillium wilt (*Verticillium dahliae*).
- Fruit is large and firm, and holds well in the rains. Suitable for shipping and local market consumption.
- Fruit tastes best when it is picked darker in color, past the glossy bright red stage.

# **Camino Real**

- Compact growth habit.
- Resistant to Verticillium (*Verticillium dahliae*) and Phytophthora(*Phytophthora cactorum*). Relatively resistant to Anthracnose crown rot (*Colletotrichum acutatum*).
- Attractive, mostly symmetrical conic fruit.
- 'Camino Real' has good flavor and is suitable for fresh market and processing.
- Darker color (internal and external) compared to 'Camarosa'.





# Chandler



- UC Davis cultivar released in 1983.
- June bearing.
- Adaptable to eastern U.S. including matted row production.
- Susceptible to diseases.
- Fruit size is medium to large, with medium firmness.
- Good for pick your own farms.
- Most reliable yielding variety for the upper piedmont, foothills, and coastal plains in Virginia and North Carolina.

# **Flavorfest**



- Good plant vigor.
- Fruits are attractive, bright red, with excellent flavor.
- Berry size is larger compared with 'Chandler'.
- Suited for both annual plasticulture and matted row production systems.
- Resistant or tolerant to steam or leaf diseases.



### Merced

Virginia Cooperative Extension

Virginia Tech • Virginia State University

- University of California variety. Released in 2014.
- Short day (June bearing) variety.
- Moderate plant vigor
- Resistant to Phytophthora crown rot and common leaf spot. Moderately resistant to powdery mildew. But moderately susceptible to Anthracnose crown rot and Verticillium wilt.
- High quality fruit with a lighter color and high production. Produces large berries with good firmness and sweetness.



# **NCS 10-038**

Virginia Cooperative Extension

Virginia Tech · Virginia State University

- North Carolina germplasm. Selected in 2010.
- Late Season Short day variety.
- Moderate plant vigor and have an open canopy
- Possible 'Chandler' replacement. Fruit is more firm, higher yielding and a more uniform season production.



# NCS 10-156

Virginia Cooperative Extension

Virginia Tech • Virginia State University

- North Carolina variety. Selected in 2010
- Early Season Short day variety.
- Possible replacement for 'Sweet Charlie'.
- Good size fruit with glossy red exterior and uniform conical shape.
- Good for local markets and home gardens.







- Lassen Canyon variety. Released in 2014.
- Plants have moderate to high vigor.
- High disease tolerance especially against Fusarium wilt
- Fruit is large and good firmness and taste.
   They tend to produce slightly less than 'Chandler'











# Lucia





# **Rutgers Scarlet**

- Can be grown in both plasticulture and matted row production.
- Moderate to high plant vigor and have an open canopy.
- Fruit has a deep-red color, uniform conical shape but was a low yielding variety.





# **Sweet Charlie**



- Fruits are medium in size with high sugar-acid ratio, so berries are sweet to taste.
- Tolerant to Anthracnose fruit rot.
- 'Sweet Charlie typically bears 5 to 10 days prior to 'Chandler' in the growing season.
- Good for U-pick operations and home growers.



# Acknowledgements

- Virginia Agricultural Council.
- Lassen Canyon Nursery.
- Vaughan Farms.
- Motley's Strawberry Farm.
- Mann Farms.