

Title: Trialing advanced strawberry selections in the Southern Region
Type of report: Progress
Grant code: 2015-02
Research proposal

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Objective: To evaluate advanced selections of strawberries from the NC State University strawberry breeding program at research stations and on-farm locations throughout the SEUS.

Justification and Description

For the past 20 years, two cultivars have been the backbone of the southeastern US strawberry production acreage. ‘Chandler’ released by the University of California in 1982, is adapted to the wide range of climates and soils across the southeast region. ‘Chandler’ has consistently high

yields, excellent flavor and is a favorite of pick-your-own customers. ‘Camarosa’ was released by UC in 1992. It was at first rejected by the industry because of its firmness, however, overtime ‘Camarosa’ has grown in popularity, and has begun to replace ‘Chandler’ acreage in specific regions of the SE. ‘Camarosa’ is grown for its exceptional fruit firmness, excellent post-harvest life and large, deep red fruit. A third cultivar, ‘Sweet Charlie’, a variety from the University of Florida is the cultivar that is most often planted when growers want to establish fruit in early market windows, as it ripens 5-7 days before ‘Chandler’. However the yield of ‘Sweet Charlie’ is low in comparison, and the flavor is either really liked or just tolerated by growers and customers.

The strawberry breeding program at NC State University has undergone recent transitions (2008 and 2014), with changes in leadership. However, with cooperation between the leaders, the program has continued to move forward. We have developed a number of advanced lines of strawberry that are adapted to the climate of the Southeastern US. In 2014, 18 advanced lines were evaluated at 3 locations in NC. Data collected in 2014 and previous years, has indicated that of these 18 advanced lines, 2 are candidates for the next step in evaluation, trialing at locations outside of our research station system. NCS 10-156 is an early genotype that has uniform fruit with excellent flavor, rich red color that has consistently good yields. It is a potential ‘Sweet Charlie’ replacement. It is a bit soft, comparable or better than ‘Sweet Charlie’ or ‘Chandler’. The other promising selection is NCS 10-038. It is a potential ‘Chandler’ replacement with high yields, firmer fruit and its more uniform production across the season than ‘Chandler’.

Methodologies and Results

In the summer of 2014, we sent the two elite selections (NCS10-056 and NCS 10-038) to the Micropropagation and Repository Unit (MPRU) at NC State University. The MPRU produces, maintains and supplies specific pathogen-tested plant material of berry crops including strawberry. The program uses thermal therapy to eliminate viruses from plants and assesses plants for known viruses using laboratory tests and biological indexing. The MPRU is part of the National Clean Plant Network for Berries (NCPN-B) (<http://www.ncpnberries.org>). The MPRU was able to produce meristemmed and virus tested plants by the summer of 2015. During the fall and winter of 2015, mother plants are being produced and will be sent to a commercial nursery grower in 2016. Plugged plants and tips should be available in the late summer and fall of 2016 on a limited basis (need to be approved by NCSU) from the nursery.

We were able to generate plants for our own trials and for distribution to Jayesh Samtani in Virginia and Andy Rollins in SC. Yield data for plants set in 2015 and harvested in spring 2016 in NC, SC and VA will be provided to SRSFC in late 2016.

We are providing yield data for the spring of 2015 (Tables 1 and 2). The 2015 trials consisted of 3 reps, 20 plants each, in 10 ft. plots. NCS 10-038 had total, marketable weights and fruit size equivalent to Chandler at both locations, and was the highest in the trials. Percent marketable yield was higher at just the Piedmont Research Station in Salisbury, NC. NCS 10-156 also had statistically equivalent total yields to Chandler, however marketable yields were lower. Fruit attributes (Table 3) show that NCS 10-156 and NCS 10-038 are as good or better than Chandler, Camarosa or Sweet Charlie.

Conclusions

Potential release of NCS 10-038 and NCS 10-156 is dependent on performance in locations outside of our NCSU research stations (at the cooperating sites in SC and VA) in the upcoming years. A more complete summary for publication in the SRSFC newsletter can be provided after we see how these selections perform in 2016/2017. We include the 2015 data that was presented at the November 2015 SE Strawberry Expo in Concord, NC.

Publications

None at this time.

Table 1. Total yield, marketable yield, percent marketable yield and average berry weight at Piedmont Research Station, Salisbury NC, 2015.

	Total Yield (lbs./A)		Marketable Yield (lbs./A)		Percentage Marketable Yield (% of total)		Average berry weight (g)	
NCS10-038	28823	a	24798	a	85.947	bc	22.524	bcde
Chandler	28134	a	20843	ab	74.41	a	17.953	ghf
NC10-032	25865	a	21822	ab	84.347	abc	23.085	bcde
San Andreas	22549	ab	18366	bc	81.487	abc	22.992	bcde
Benecia	21283	abc	18464	bc	86.971	bc	25.532	bc
Camino Real	19914	abcd	17600	bcd	87.921	c	24.665	bcd
Merced	19323	abcde	15088	cde	77.755	abc	22.19	bcde
NCS 10-156	16055	abcdef	13274	def	82.603	abc	18.888	efgh
Sweet Ann	15203	bcdef	12634	efg	83.078	abc	37.679	a
Albion	11980	cdefg	10223	fgh	84.515	abc	25.756	b
Festival	11484	defg	9693	fgh	84.351	abc	17.933	fgh
Sweet Charlie	11083	defg	8585	fgh	76.524	ab	14.904	h
NC 09-011	10547	defg	8327	fgh	78.228	abc	21.224	cdefg
Camarosa	10285	efg	7960	gh	77.826	abc	20.441	defg
NC10-777	9647	fg	7514	h	78.116	abc	20.384	defg

Table 2. Total yield, marketable yield, percent marketable yield and average berry weight, at Central Crops Research Station, Clayton, NC, 2015.

	Total Yield (lbs/A)		Marketable Yield (lbs/A)		Percentage Marketable Yield (% of total)		Average berry weight (g)	
NCH 10-041	28166	a	24058	a	85.164	ab	22.759	cdefg
Chandler	28134	a	24250	a	85.63	ab	20.799	efgh
Merced	27258	a	24877	a	91.445	ab	27.254	bc
Sweet Ann	27219	a	23571	a	86.895	ab	35.7	a
NCS 10-038	25171	a	23674	a	94.039	ab	24.343	bcdef
San Andreas	24742	ab	22381	ab	90.375	ab	25.154	bcde
NC10-032	22797	ab	18854	abc	83.147	ab	23.532	bcdef
Benecia	22426	abc	20064	ab	89.427	ab	25.168	bcd
Camino Real	20998	abc	19366	abc	92.16	ab	25.564	bcd

NCS 10-156	20992	abc	19002	abc	90.488	ab	20.722	efgh
Festival	14810	bcd	13491	bcd	91.213	ab	18.816	gh
NCS 10-777	12947	cd	10586	cd	81.95	b	21.16	defgh
Albion	10624	d	9741	d	91.804	ab	27.58	b
Sweet Charlie	9370	d	8416	d	90.064	ab	17.26	h
Camarosa	8138	d	5066	d	61.573	c	19.768	fgh

Table 3. Qualitative scores of fruit attributes taken at one harvest at the Central Crops Research Station, Clayton, NC May 4, 2015. Scores are on a scale of 1-9, see also specific scales for each trait. Scores are average of 3 plots.

	Gloss (rating; 1=dull; 9=shiny)	Fruit firmness (rating; 1=mush; 9= hard)	Skin (rating; 1=soft; 9=tough)	External color (rating; 1=white; 5=red; 9="black")	Internal (rating; 1=white; 5=red; 9="black")	Flavor (rating; 1= poor flavor; 9= excellent intense flavor)
Camarosa	8	8	8	7	7	6
Chandler	8	6	6	7	7	6
Sweet Charlie	8	6	6	7	6	8
NCS 10-038	8	7	7	8	7	7
NCS 10-156	8	7	7	8	7	8