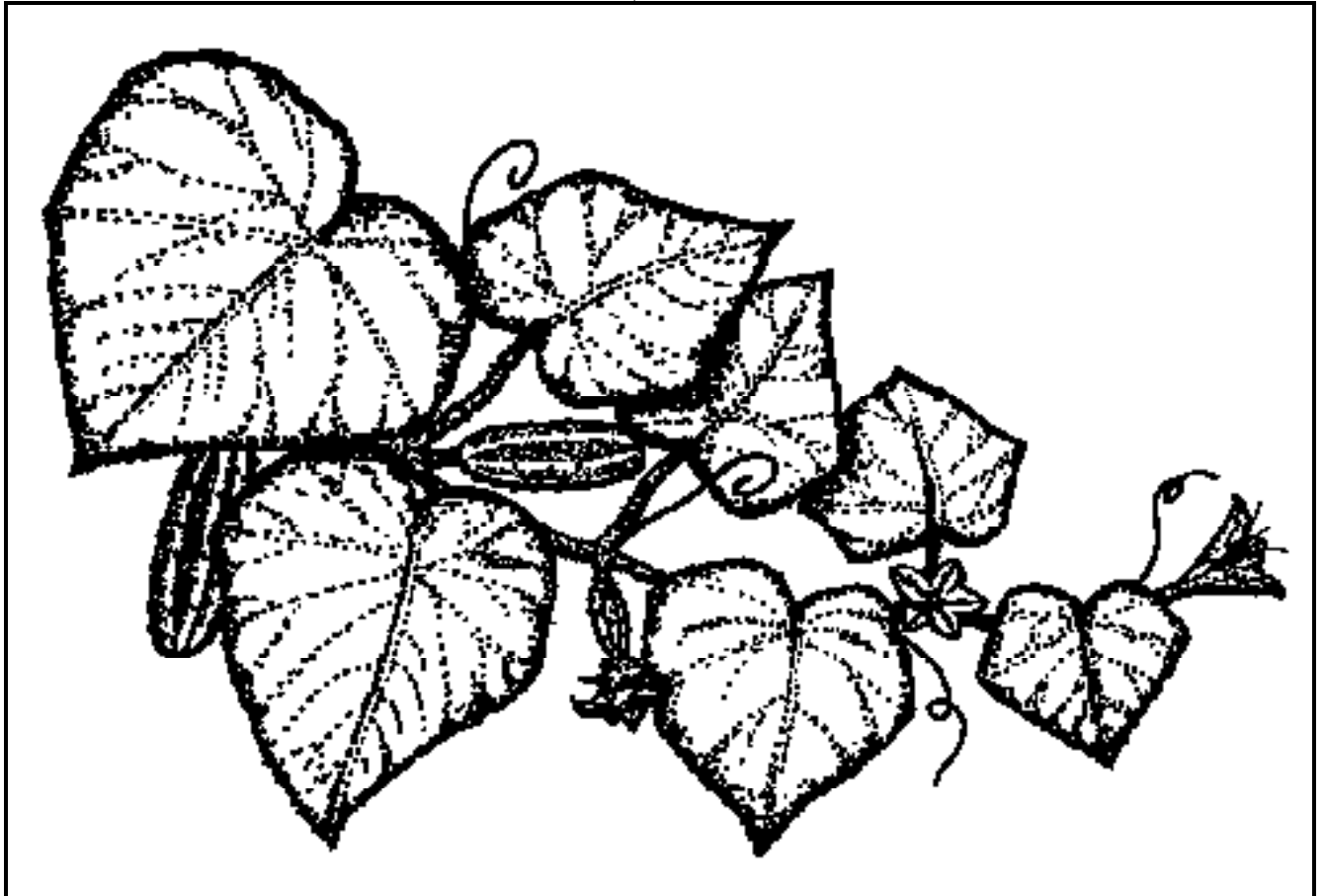


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NC State Cucumber Trials 2013



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The authors gratefully acknowledge the assistance of Rodney Mozingo and the personnel at the Horticultural Crops Research Station, Clinton, NC for help in planting, maintaining, and harvesting the trials.

About This Report

The data contained in this publication are made available to interested persons so that they will be informed as to the nature and scope of our cucumber breeding program. Since the results of the trials are based on one year's data, they should be interpreted cautiously. Genotype x environment interactions make it likely that the performance of any given cultigen (cultivar or breeding line) will be significantly different in other trials. Often, cultigens that perform well for yield, earliness, fruit quality, or disease resistance in one trial will perform significantly worse in other trials.

Other factors, known only to the researchers, may complicate the interpretation of the results, making it difficult for others to interpret differences from one year to the next. For example, the effect of seed lot, pollenizer, harvest labor, irrigation, fertilizer, pollinating insects and weather patterns may cause some test plots in the field to receive better or worse treatment than average. Therefore, we urge caution in interpreting these data. Conclusions drawn by the reader will be more accurate if they are of a general nature. For example, note which cultigens performed in the top third for yield, rather than which one was at the very top.

Pricing schemes

Value of production figures were obtained by assigning the following prices for the marketable grades:

Grade	Spring \$/cwt	Summer \$/cwt
No.1 (< 1 1/16")	\$19.30	\$19.30
No.2 (1 1/16 - 1 1/2")	11.05	11.05
No.3 (1 1/2 - 2")	7.75	7.75
No.4 (> 2")	0.00	0.00

The pricing system is the one currently in use in North Carolina (averaged over the spring and summer crops) and is revised annually. The same pricing systems are applied to all production in a particular year even though commercial prices for summer production are usually higher than for spring production.

Yield is presented in cwt/A to make it easy to convert to other useful values. For example, approximation of bu/A can be obtained by taking cwt/A x2, MT/ha by taking cwt/A x 1/10, and t/A by taking cwt/A x 1/20.

Progression of breeding lines through trials:

Stage 1 trial	Stage 2 trial	Stage 3 trial	Stage 4 trial
2 replications -->	1 replication -->	3 replications -->	3 replications
1 harvest	6 harvests	6 harvests	6 harvests
		spring season	summer season

The cost of planning these trials, doing the field work, running the data analysis, and summarizing the results for this report was approximately \$48,000 for the brinestock, pickling and slicing cucumber trials. The report is no longer printed, and is available on the web.

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Pickling Cucumbers

Brinestock Evaluation

Spring (Stage 3) Pickle Trial

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Introduction

Cucumbers from harvests 3, 5 and 7 of the stage 3 spring pickling cucumber trial were each placed in brine tanks at Mt. Olive Pickle Co. The tanks were purged with nitrogen to remove excess carbon dioxide from the brine.

Methods

The cultigens (cultivars and breeding lines) were evaluated for fruit quality (shape, external color, texture, seedcell size, and lot uniformity), firmness, bloaters, and other defects in October. Quality was evaluated by judges from industry: Phil Denlinger and Bob Quinn (Mt. Olive), Curtiss and John Cates (Addis Cates Co.), Donovan Brock (Bay Valley), Laura Kornegay (Nash Produce), and Chris Ware (HM-Clause).

Fruit quality was evaluated using a rating system (that approximated letter grades) from 1 to 9, where 9 = A+, 8 = A, 7 = A-, 6 = B+, 5 = B, 4 = B-, 3 = C, 2 = D, 1 = F. Bloaters and defects were measured as percentage of fruits with damage in a sample of 20 grade 3B fruits. Firmness was measured by punching 10 grade 2B fruits with a Magness-Taylor tester (having a 5/16" diameter tip). All cultigens were randomized, replicated and coded to prevent bias and provide a measure of error variance.

Results

The cultigens are presented in order by decreasing fruit quality in Table 1, and are ranked for resistance to bloaters and defects in Tables 2 and 3, respectively. Fruit texture and firmness rankings are in Table 4. The average quality ratings assigned by each judge in the test are presented in Table 5, showing how lenient each judge was relative to the others. Because of low bloater incidence, the bloater data showed few significant differences among cultigens.

Summary

- The cultigens with best fruit quality in brinestock were Supremo, Vlasplik, USACX-214, Lafayette, Xtreme and USACX-224.
- Most cultigens were bloater and defect resistant; some were susceptible: Feisty and USACX-224.
- As usual, brinestock firmness (from the punch test) was only partially correlated with texture (subjective rating from the judges), so the two traits are measurements of different aspects of cucumber fruit firmness.
- Judges ranged from Kornegay who assigned the highest quality ratings, to C.Cates who assigned the lowest. Analysis of variance indicated significant differences among judges for the way they rated fruit quality. However, interaction of judge with cultigen was non-significant (the judges agreed on which were good cultigens, and which were bad cultigens).

² Thanks to Mt. Olive Pickle Co., Mt. Olive, N.C. for assistance in brining the cucumbers, and for providing the facilities for evaluating the cultigens tested. Thanks also to the personnel at the Horticultural Crops Research Station, Clinton, N.C. for help in running the field trials.

Table 1. Brinestock evaluation - quality ratings (cultigens are ranked by average quality).²

Rank	Cultivar or line	Seed source	Average quality	Shape	Extrnal color	Text-ure	Seed cell	Uniform-ity
1	Supremo	USAgriSeeds	6.1	5.8	6.7	5.9	6.0	6.2
2	Vlaspik	Mon-Seminis	6.0	5.5	6.0	6.5	6.1	6.0
3	USACX-214	USAgriSeeds	5.9	5.8	6.0	5.8	5.5	6.4
4	Lafayette	BayerNunhems	5.8	5.4	6.0	6.0	5.6	6.1
5	Xtreme	USAgriSeeds	5.8	5.6	6.7	5.3	5.6	5.9
6	USACX-224	USAgriSeeds	5.7	5.1	6.2	5.5	5.6	6.1
7	Feisty(9464)	HM-Clause	5.5	4.9	6.2	5.5	5.3	5.5
8	Calypso	NCState Univ	5.3	4.9	5.5	5.2	5.2	5.8
9	Johnston	NCState Univ	5.2	4.9	5.7	5.0	5.0	5.7
	Mean		5.7	5.3	6.1	5.6	5.6	6.0
	LSD (5%)		0.5	0.8	0.6	0.8	0.8	0.6

² Quality rated 1 to 9 (9=A+, 8=A, 7=A-, 6=B+, 5=B, 4=B-, 3=C, 2=D, 1=F).
 Correlation (Shape with Uniformity) = 0.84**
 Correlation (Texture with Seedcell) = 0.92**

Table 2. Brinestock evaluation - percentage of fruit damaged by bloaters (cultigens are ranked by balloon bloater resistance).

Rank	Cultivar or line	Seed source	Total bloaters	Balloon	Lens	Honey-comb
1	Johnston	NCState Univ	0	0	0	0
2	Lafayette	BayerNunhems	0	0	0	0
3	Supremo	USAgriSeeds	1	1	0	0
4	Vlaspik	Mon-Seminis	1	1	1	0
5	USACX-214	USAgriSeeds	1	1	0	0
6	USACX-224	USAgriSeeds	2	2	0	0
7	Calypso	NCState Univ	4	3	1	0
8	Xtreme	USAgriSeeds	4	4	0	0
9	Feisty(9464)	HM-Clause	9	8	1	0
	Mean		2	2	0	0
	LSD (5%)		6	5	1	0

Table 3. Brinestock evaluation - percentage of fruit damaged by defects (cultigens are ranked by resistance to defects).

Rank	Cultivar or line	Seed source	Total defects	Placental hollows	Blossom-end defects	Soft centers
1	Supremo	USAgriSeeds	2	0	0	2
2	Lafayette	BayerNunhems	3	2	0	1
3	Vlaspik	Mon-Seminis	4	1	0	3
4	USACX-214	USAgriSeeds	4	2	0	2
5	Feisty(9464)	HM-Clause	4	0	0	4
6	Calypso	NCState Univ	4	0	0	4
7	Xtreme	USAgriSeeds	5	1	0	4
8	Johnston	NCState Univ	5	0	0	5
9	USACX-224	USAgriSeeds	10	8	0	3
	Mean		5	2	0	3
	LSD (5%)		6	3	0	8

Table 4. Brinestock evaluation - firmness and texture of fruit, and resistance to bloaters and defects (cultigens are ranked by firmness).²

Rank	Cultivar or line	Seed source	Firmness (lb.)	Texture	Total bloaters & defects	Total bloaters	Balloon	Defects
1	Supremo	USAgriSeeds	19.2	5.9	2	1	1	2
2	Calypso	NCState Univ	19.0	5.2	8	4	3	4
3	USACX-214	USAgriSeeds	18.8	5.8	5	1	1	4
4	Xtreme	USAgriSeeds	18.6	5.3	9	4	4	5
5	Vlaspik	Mon-Seminis	18.6	6.5	5	1	1	4
6	Johnston	NCState Univ	18.5	5.0	5	0	0	5
7	Lafayette	BayerNunhems	17.8	6.0	3	0	0	3
8	USACX-224	USAgriSeeds	17.7	5.5	12	2	2	10
9	Feisty(9464)	HM-Clause	17.0	5.5	13	9	8	4
	Mean		18.4	5.6	7	2	2	5
	LSD (5%)		2.4	0.8	9	6	5	6

² Firmness determined by punch-testing (Magness-Taylor) 10 grade 2B fruits. Correlation of Texture with: Firmness = 0.15ns, Balloon = -0.42*
Correlation of Texture with: Honeycomb = 0.15ns, Soft centers = -0.85**

Table 5. Brinestock evaluation - quality ratings assigned by the judges (judges are ranked by leniency).²

Rank	Judge	Average quality	Shape	External color	Texture	Seed cell	Uniformity
1	Kornegay	7.1	7.0	7.2	7.2	6.8	7.1
2	Denlinger	7.0	6.3	7.4	6.7	7.0	7.5
3	CatesJ	6.0	5.4	6.3	6.0	6.1	6.3
4	Brock	5.8	5.6	6.3	5.7	5.8	5.6
5	Ware	5.2	4.8	5.8	5.2	5.1	5.0
6	Quinn	4.6	3.9	5.0	4.4	3.7	6.0
7	CatesC	4.4	4.2	4.9	4.2	4.4	4.3

² Quality rated 1 to 9 (9=A+, 8=A, 7=A-, 6=B+, 5=B, 4=B-, 3=C, 2=D, 1=F).

Pickling Cucumbers

Spring Pickling Cucumber Trial 2013

Todd C. Wehner and Tammy L. Ellington

Experiment Design

1. A randomized complete block with 3 replications of pickle cultivars and breeding lines (collectively referred to as cultigens) was grown.
2. Plots were single 20 ft. rows with 5 ft. alleys at each end.
3. Rows were on raised 18" beds spaced 60" apart (center to center).
4. Fertilizer consisted of 80-80-80 lb/A (N-P-K) broadcast preplant and 30-0-0 lb/A (N-P-K) sideplaced at the 2 to 4 leaf stage.
5. Curbit was applied preemergence at the rate of 1 lb. a.i./A.
6. The trial was planted 9 May, and harvested 6 times (Mondays and Thursdays) between 24 June and 15 July.

Data Collection

1. Firmness was measured on 3 Grade 3 fruits using a Magness-Taylor tester with a 5/16" tip.
2. Length/Diameter ratio was calculated by measuring 5 Grade 2 fruits.
3. Quality ratings were from 1 to 9, with 1 = worst, 9 = best.
4. Disease ratings were from 0 to 9, with 0 = no disease, 1-2 = trace, 3-4 = slight, 5-6 = moderate, 7-8 = severe, 9 = plant dead.

Results

The following cultigens performed well, and could be advanced to the next stage:

1	Feisty(9464)	HM-Clause
2	Johnston	NCState Univ
3	Lafayette	BayerNunhems
4	Xtreme	USAgriSeeds
5	Supremo	USAgriSeeds
6	Vlaspik	Mon-Seminis

Table 6. Stage 3 spring pickle trial - yield data (cultigens are ranked by fruit value).

Rank	Cultivar or line	Seed source	Value (\$)	Weight (cwt)	Fruit grade distribution (% by weight)					Plants per A (x1000)
					Cull	No.1	No.2	No.3	No.4	
1	Feisty(9464)	HM-Clause	2950	428	13	4	22	44	17	35
2	Vlaspik	Mon-Seminis	2910	332	8	7	31	45	9	25
3	Johnston	NCState Univ	2851	475	13	3	16	45	23	35
4	Lafayette	BayerNunhems	2803	360	11	5	26	47	12	35
5	Xtreme	USAgriSeeds	2774	365	5	5	24	48	18	35
6	Supremo	USAgriSeeds	2614	350	8	5	20	50	17	35
7	Calypso	NCState Univ	2548	455	10	3	13	42	32	32
8	USACX-214	USAgriSeeds	2291	298	5	6	21	49	18	35
9	USACX-224	USAgriSeeds	1983	241	8	7	25	45	16	35
	Mean		2636	367	9	5	22	46	18	33
	LSD (5%)		969	128	4	3	7	10	12	2

Correlation (Fruit value with fruit weight) = 0.65**

Table 7. Stage 3 spring pickle trial - earliness data (cultigens are ranked by fruit value in harvests 1 and 2).

Rank	Cultivar or line	Seed source	Cumulative fruit value and % of total value ^z (8 harvests) for harvest:									
			1		1-2		1-3		1-4		1-5	
			\$/A	%	\$/A	%	\$/A	%	\$/A	%	\$/A	%
1	Johnston	NCState Univ	591	20	1261	44	1806	63	2401	84	2668	94
2	Feisty(9464)	HM-Clause	448	15	1152	39	1889	64	2461	83	2684	91
3	Lafayette	BayerNunhems	408	14	990	34	1752	62	2327	83	2517	90
4	Calypso	NCState Univ	559	22	983	40	1621	65	1951	76	2195	87
5	Xtreme	USAgriSeeds	127	4	684	24	1591	57	2059	74	2515	90
6	Supremo	USAgriSeeds	222	7	662	23	1420	53	1896	72	2287	87
7	USACX-214	USAgriSeeds	188	8	558	22	1112	47	1610	70	1997	87
8	Vlaspik	Mon-Seminis	65	2	503	15	1295	42	2069	69	2544	87
9	USACX-224	USAgriSeeds	9	0	177	9	577	30	1084	54	1533	77
	Mean		291	10	774	28	1451	53	1984	74	2327	88
	LSD (5%)		285	9	637	18	910	20	933	10	940	7

Correlation (Fruit value with value in harvests 1 and 2) = 0.76**

Table 8. Stage 3 spring pickle trial - fruit quality data (cultigens are ranked by average quality).

Rank	Cultivar or line	Seed source	Average quality ^z	Shape ^z	Color ^y	Seed- cell ^z	Overall impres- sion ^z
1	Supremo	USAgriSeeds	7.9	8.7	8.0	7.0	8.0
2	Xtreme	USAgriSeeds	7.4	7.7	8.0	7.0	7.7
3	Vlaspik	Mon-Seminis	7.0	7.3	7.0	6.3	7.3
4	USACX-214	USAgriSeeds	6.9	7.0	6.3	6.7	7.0
5	Johnston	NCState Univ	6.7	6.7	6.7	6.3	7.0
6	USACX-224	USAgriSeeds	6.4	6.3	6.3	6.7	6.3
7	Feisty(9464)	HM-Clause	6.2	6.7	7.3	5.7	6.3
8	Lafayette	BayerNunhems	6.2	6.7	6.7	5.3	6.7
9	Calypso	NCState Univ	5.9	6.3	5.7	5.3	6.0
	Mean		6.7	7.0	6.9	6.3	6.9
	LSD (5%)		1.1	1.3	1.5	1.9	1.1

^z Quality rated 1 to 9 (1 = poor, 5 = average, 9 = excellent).

^y Color rated 1 to 9 (1 = white, 5 = medium green, 9 = very dark green).

Correlation (Fruit value with average quality) = -0.13^{ns}

Table 9. Stage 3 spring pickle trial - other quality data (cultigens are ranked by average quality).^z

Rank	Cultivar or line	Seed source	Firm- ness	L/D ratio	Defects1 ^o			Defects2 ^o		
					2	4	6	2	4	6
1	Supremo	USAgriSeeds	18	3.3	K	K	K	H	K	K
2	Johnston	NCState Univ	17	3.6	G	G	G	T	T	T
3	Xtreme	USAgriSeeds	17	3.2	K	K	H	H	K	K
4	Vlaspik	Mon-Seminis	16	3.6	K	K	K	K	G	T
5	Calypso	NCState Univ	16	3.0	H	H	K	O	M	K
6	USACX-214	USAgriSeeds	16	3.3	T	K	K	G	T	T
7	Lafayette	BayerNunhems	16	3.6	K	K	K	T	T	T
8	USACX-224	USAgriSeeds	15	3.9	G	G	K	T	A	T
9	Feisty(9464)	HM-Clause	15	3.5	T	G	T	A	T	G
	Mean		16	3.4						
	LSD (5%)		2	0.3						

^z Quality rated 1 to 9 (1 = poor, 5 = average, 9 = excellent).

Defects were rated as follows (giving primary and secondary for each harvest):

A - wArty fruit	J - RiDGed	S - Separated carpels
B - Blossom end defects	K - Keep(excellent)	T - Tapered ends
C - Crooks excessive	L - Late maturity	U - Uniform green
D - Dogbone shape	M - Mottled fruit	V - Varicolor (dark stem end, light blossom end)
E - Early maturity	N - Nubs excessive	W - White fruit
F - Four celled	O - Offtype fruit	X - neCKS on fruit
G - lonG fruit	P - Placental hollows	Y - Yellow fruit
H - sHort fruit	Q -	Z - diSeased fruit
I - strIpEd fruit	R - Reject (poor)	

Table 10. Stage 3 spring pickle trial - sex expression and vine data (cultigens are ranked by gynoecious rating).

Rank	Cultivar or line	Seed source	Gyn. rating ^z	Vine size ^y	Vine color ^x
1	Feisty(9464)	HM-Clause	9	9	8
2	Calypso	NCState Univ	9	8	7
3	Lafayette	BayerNunhems	9	5	8
4	Johnston	NCState Univ	8	8	7
5	USACX-214	USAgriSeeds	8	6	7
6	Vlaspik	Mon-Seminis	7	6	5
7	Supremo	USAgriSeeds	6	7	8
8	Xtreme	USAgriSeeds	6	9	8
9	USACX-224	USAgriSeeds	4	7	8
	Mean		7	7	7
	LSD (5%)		1	3	1

^z Gynoecious rating (1 = androecious, 2-3 = andromonoecious, 4-6 = monoecious, 7-8 = predominately gynoecious, 9 = gynoecious).

^y Size rated 1 to 9 (1=very small, 9=very large).

^x Color rated 1 to 9 (1=yellow, 9=very dark green).

Correlation (Yield w/ gynoecious rating) = 0.34ns; (Yield w/ vine size) = 0.20ns

Table 11. Stage 3 spring pickle trial - disease data (cultigens are ranked by average disease resistance).^z

Rank	Cultivar or line	Seed source	Downy mildew
1	Lafayette	BayerNunhems	2.3
2	Feisty(9464)	HM-Clause	2.7
3	USACX-224	USAgriSeeds	2.7
4	USACX-214	USAgriSeeds	3.0
5	Vlaspik	Mon-Seminis	3.3
6	Supremo	USAgriSeeds	4.7
7	Johnston	NCState Univ	5.3
8	Xtreme	USAgriSeeds	5.3
9	Calypso	NCState Univ	6.3
	Mean		4.0
	LSD (5%)		2.1

^z Disease rated 0 to 9 (0=none, 1-2=trace, 3-4=slight, 5-6=moderate, 7-8=advanced, 9=plant dead).

Correlation (Yield vs. disease rating) = 0.17ns

Table 12. Stage 3 spring pickle trial - selection indexes (cultigens ranked by SWI1).^z

Rank	Cultivar or line	Seed source	Simple weighted indexes		Average rank indexes	
			SWI1	SWI2	ARI1	ARI2
1	Feisty(9464)	HM-Clause	11.6	9.4	4.8	4.6
2	Johnston	NCState Univ	11.6	9.3	4.8	4.1
3	Lafayette	BayerNunhems	10.9	8.8	5.2	5.0
4	Xtreme	USAgriSeeds	9.8	8.2	4.3	4.9
5	Supremo	USAgriSeeds	9.7	8.2	3.8	4.2
6	Vlaspik	Mon-Seminis	9.6	8.2	4.7	5.1
7	Calypso	NCState Univ	9.6	7.9	6.6	6.0
8	USACX-214	USAgriSeeds	8.8	7.5	5.1	5.2
9	USACX-224	USAgriSeeds	6.8	6.2	5.9	6.0
	Mean		9.8	8.2	5.0	5.0
	LSD (5%)		3.3	2.1	1.5	1.5

^z SWI is simple weighted index calculated from the performance of a cultigen for yield; earliness; fruit shape, seedcell size and overall impression; and disease resistance. The index is calculated with 2 different methods of weighting each trait (10 is best, 1 is worst).

ARI is the average ranking of each cultigen for yield, earliness, fruit quality and disease resistance. The index is calculated with 2 different sets of secondary traits added in with the primary traits (1 is best).

Correlation (Yield with SWI1) = 0.90** Correlation (Yield with ARI1) = -0.44**

Slicing Cucumbers

Spring Slicing Cucumber Trial 2013

Todd C. Wehner and Tammy L. Ellington

Experiment Design

1. A randomized complete block with 3 replications of slicer cultivars and breeding lines (collectively referred to as cultigens) was grown.
2. Plots were single 20 ft. rows with 5 ft. alleys at each end.
3. Rows were on raised 18" beds spaced 60" apart (center to center).
4. Fertilizer consisted of 80-80-80 lb/A (N-P-K) broadcast preplant and 30-0-0 lb/A (N-P-K) sideplaced at the 2 to 4 leaf stage.
5. Curbit was applied preemergence at the rate of 1 lb. a.i./A.
6. The trial was planted 9 May, and harvested 6 times (Mondays and Thursdays) between 27 June and 15 July.

Data Collection

1. Fruits were weighed after sorting into No.1, No.2 and cull (nubs and crooks) grades according to U.S.D.A. standards.
2. Fruit length, diameter and weight were recorded for 3 fruit per plot.
3. Quality ratings were from 1 to 9, with 1 = worst, 9 = best.
4. Disease ratings were from 0 to 9, with 0 = no disease, 1-2 = trace, 3-4 = slight, 5-6 = moderate, 7-8 = severe, 9 = plant dead.

Results

The following cultigens performed well, and could be advanced to the next stage:

1	Thunder	Mon-Seminis
2	Superior	USAgriSeeds
3	Intimidator	Mon-Seminis
4	Warrior	USAgriSeeds
5	General Lee	HMClause
6	Mestizo	USAgriSeeds

Table 13. Stage 3 spring slicer trial - yield data (cultigens ranked by cwt/A of Fancy + No. 1 grade fruit).

Rank	Cultivar or line	Seed source	Yield(cwt/A)		Percent fancy +No.1	Percent culls	Plants per A (x1000)
			Fancy +No.1	Market- able			
1	Thunder	Mon-Seminis	317	470	57	14	35
2	General Lee	HMClaude	296	380	66	15	35
3	Superior	USAgriSeeds	291	377	70	9	35
4	Intimidator	Mon-Seminis	276	416	58	12	10
5	Dasher II	Mon-Seminis	226	294	69	10	16
6	Cobra	USAgriSeeds	207	304	54	21	35
7	Warrior	USAgriSeeds	204	271	62	17	35
8	Mestizo	USAgriSeeds	184	258	60	15	35
9	Senor	USAgriSeeds	163	216	64	17	32
10	Navajo	USAgriSeeds	133	188	56	21	35
11	Lider	USAgriSeeds	123	174	56	21	35
12	Ashley	Check	86	103	82	2	35
	Mean		209	287	63	14	31
	LSD (5%)		90	104	9	6	3

Correlation (Marketable yield with % culls) = -0.07ns

Table 14. Stage 3 spring slicer trial - earliness data (cultigens ranked by weight of Fancy + No.1 grade fruit in harvests 1 and 2).

Rank	Cultivar or line	Seed source	Cumulative fruit weight and % of total weight (6 harvests) for harvest:									
			1		1-2		1-3		1-4		1-5	
			Wt.	%	Wt.	%	Wt.	%	Wt.	%	Wt.	%
1	Thunder	Mon-Seminis	106	22	337	71	364	77	407	86	432	92
2	Superior	USAgriSeeds	43	11	220	58	281	75	328	87	349	93
3	Cobra	USAgriSeeds	67	20	175	57	214	70	257	85	288	95
4	General Lee	HMClaude	42	12	171	44	270	71	298	78	341	90
5	Intimidator	Mon-Seminis	8	2	120	31	206	53	277	69	313	77
6	Dasher II	Mon-Seminis	15	5	107	36	152	52	218	74	260	89
7	Warrior	USAgriSeeds	9	3	88	32	153	55	199	74	237	87
8	Mestizo	USAgriSeeds	5	2	80	28	138	53	188	74	229	90
9	Lider	USAgriSeeds	0	0	21	12	49	29	102	59	132	76
10	Senor	USAgriSeeds	4	1	20	8	111	48	163	75	179	82
11	Navajo	USAgriSeeds	3	1	19	10	71	38	123	67	156	84
12	Ashley	Check	0	0	0	0	26	25	46	44	72	70
	Mean		25	7	113	32	170	54	217	73	249	85
	LSD (5%)		42	10	80	18	88	21	77	16	81	10

Correlation (Marketable yield with yield in harvests 1-2) = 0.85**

Correlation (Marketable yield with % of yield in harvests 1-2) = 0.75**

Table 15. Stage 3 spring slicer trial - fruit quality data (cultigens ranked by average quality).^z

Rank	Cultivar or line	Seed source	Average quality	Shape	Color	Seed-cell	Overall impression
1	Warrior	USAgriSeeds	7.7	8	8	7	8
2	Senor	USAgriSeeds	7.6	8	9	7	8
3	Intimidator	Mon-Seminis	7.6	8	9	7	8
4	Lider	USAgriSeeds	7.6	8	8	7	8
5	Superior	USAgriSeeds	7.3	7	9	8	7
6	Thunder	Mon-Seminis	7.2	7	8	7	7
7	Dasher II	Mon-Seminis	7.1	7	8	7	7
8	Mestizo	USAgriSeeds	6.9	7	8	7	7
9	Navajo	USAgriSeeds	6.8	7	8	7	7
10	Cobra	USAgriSeeds	6.8	7	8	7	7
11	General Lee	HMClause	6.7	7	7	7	7
12	Ashley	Check	4.7	5	4	4	5
	Mean		7.0	7	8	7	7
	LSD (5%)		0.9	1	1	1	1

^z Quality rated 1 to 9 (1 = poor, 5 = average, 9 = excellent; except color where 1 = white, 5 = medium green, 9 = very dark green). Correlation (Marketable yield with average quality) = 0.39*

Table 16. Stage 3 spring slicer trial - fruit dimensions and comments (cultigens ranked by average quality rating).^z

Rank	Cultivar or line	Seed source	Length (inch)	Diameter (inch)	Wt. (lb.)	Defect 1°			Defect 2°		
						2	4	6	2	4	6
1	Warrior	USAgriSeeds	8.7	2.0	0.88	K	K	K	K	K	H
2	Senor	USAgriSeeds	8.7	2.1	0.85	K	K	K	T	T	H
3	Intimidator	Mon-Seminis	9.0	2.1	0.85	H	K	K	K	H	T
4	Lider	USAgriSeeds	8.7	2.0	0.81	G	K	K	K	T	K
5	Superior	USAgriSeeds	8.5	2.0	0.78	K	K	T	H	T	K
6	Thunder	Mon-Seminis	8.8	2.1	0.84	H	H	K	T	T	T
7	Dasher II	Mon-Seminis	8.1	2.0	0.78	K	H	K	H	K	T
8	Mestizo	USAgriSeeds	9.0	2.1	0.96	G	K	H	K	K	D
9	Navajo	USAgriSeeds	8.4	2.0	0.81	M	O	K	H	H	K
10	Cobra	USAgriSeeds	8.8	2.2	0.96	H	K	D	K	T	T
11	General Lee	HMClause	8.6	2.1	0.87	H	H	H	T	T	T
12	Ashley	Check	7.3	2.0	0.65	H	H	H	M	M	M
	Mean		8.6	2.1	0.84						
	LSD (5%)		0.6	0.2	0.17						

^z Defects were rated as follows (giving primary and secondary for each harvest):

A - wArty fruit	J - RiDGed	S - Separated carpels
B - Blossom end defects	K - Keep(excellent)	T - Tapered ends
C - Crooks excessive	L - Late maturity	U - Uniform green
D - Dogbone shape	M - Mottled fruit	V - Varicolor (dark stem end, light blossom end)
E - Early maturity	N - Nubs excessive	W - White fruit
F - Four celled	O - Offtype fruit	X - neCKS on fruit
G - lonG fruit	P - Placental hollows	Y - Yellow fruit
H - sHort fruit	Q -	Z - diSeased fruit
I - strIPed fruit	R - Reject (poor)	

Table 17. Stage 3 spring slicer trial - sex expression and vine data (cultigens ranked by gynoecious rating).

Rank	Cultivar or line	Seed source	Gyn. rating ^z	Early yield (cwt/A)	Earliness (%) ^x	Vine size ^w	Vine color ^w
1	Cobra	USAgriSeeds	8	175	57	7	7
2	Superior	USAgriSeeds	8	220	58	9	9
3	Thunder	Mon-Seminis	8	337	71	8	7
4	General Lee	HMClause	8	171	44	8	6
5	Intimidator	Mon-Seminis	8	120	31	6	5
6	Dasher II	Mon-Seminis	8	107	36	6	7
7	Warrior	USAgriSeeds	5	88	32	8	7
8	Senor	USAgriSeeds	5	20	8	8	6
9	Lider	USAgriSeeds	5	21	12	7	7
10	Navajo	USAgriSeeds	4	19	10	8	8
11	Ashley	Check	4	0	0	6	5
12	Mestizo	USAgriSeeds	3	80	28	8	8
	Mean		6	113	32	7	7
	LSD (5%)		1	80	18	1	2

^z Gynoecious rating (1 = androecious, 2-3 = andromonoecious, 4-6 = monoecious, 7-8 = predominately gynoecious, 9 = gynoecious).

^y Early yield is weight of Fancy+No.1 grade fruit produced in harvests 1 and 2.

^x Earliness is the percent of the yield (Fancy + No.1 grade fruit) of 6 harvests that was produced in harvests 1 and 2.

^w Vine size & color are rated 1 (small or yellow green) to 9 (large or dark green) Correlation (Marketable yield with gynoecious rating) = 0.69**

Table 18. Stage 3 spring slicer trial - disease ratings (cultigens ranked by average disease resistance).^z

Rank	Cultivar or line	Seed source	Downy mildew
1	Warrior	USAgriSeeds	3.0
2	Ashley	Check	3.0
3	Navajo	USAgriSeeds	4.3
4	Dasher II	Mon-Seminis	4.7
5	Lider	USAgriSeeds	4.7
6	Intimidator	Mon-Seminis	5.0
7	Mestizo	USAgriSeeds	5.0
8	Superior	USAgriSeeds	5.3
9	Thunder	Mon-Seminis	5.3
10	General Lee	HMClause	5.3
11	Cobra	USAgriSeeds	5.7
12	Senor	USAgriSeeds	6.0
14	Mean		4.8
15	LSD (5%)		1.2

^z Disease rated 0 to 9 (0=none, 1-2=trace, 3-4=slight, 5-6=moderate, 7-8=advanced, 9=plant dead).

Correlation (Marketable yield with disease rating) = 0.31ns

Table 19. Stage 3 spring slicer trial - selection indexes (cultigens ranked by SWI1).^z

Rank	Cultivar or line	Seed source	Simple weighted indexes		Average rank indexes	
			SWI1	SWI2	ARI1	ARI2
1	Thunder	Mon-Seminis	6.1	6.8	5.1	4.6
2	Superior	USAgriSeeds	5.5	6.2	4.9	4.9
3	Intimidator	Mon-Seminis	5.3	5.7	5.2	5.3
4	Warrior	USAgriSeeds	5.3	5.7	4.7	4.8
5	General Lee	HMClause	5.1	5.6	6.2	6.0
6	Dasher II	Mon-Seminis	4.9	5.4	6.0	6.0
7	Cobra	USAgriSeeds	4.8	5.5	7.0	6.6
8	Mestizo	USAgriSeeds	4.5	4.9	6.9	6.9
9	Lider	USAgriSeeds	4.3	4.5	6.9	7.4
10	Senor	USAgriSeeds	4.2	4.3	7.1	8.0
11	Navajo	USAgriSeeds	4.2	4.3	7.8	7.9
12	Ashley	Check	3.3	3.3	10.2	9.6
	Mean		4.8	5.2	6.5	6.5
	LSD (5%)		0.9	1.0	2.3	2.2

^z SWI is simple weighted index calculated from the performance of a cultigen for yield; earliness; fruit shape, seedcell size and overall impression; and disease resistance. The index is calculated with 2 different methods of weighting each trait (10 is best, 1 is worst).

ARI is the average ranking of each cultigen for yield, earliness, fruit quality and disease resistance. The index is calculated with 2 different sets of secondary traits added in with the primary traits (1 is best).

Correlation (Marketable yield with SWI1) = 0.88**

Correlation (Marketable yield with ARI1) = -0.68**