

UGA Vidalia Onion Variety Trial Report 2020 – 2021 Crop Season

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Introduction

The University of Georgia evaluates short day onions to determine their performance characteristics in standardized growing practices. The varieties are placed in the trial by participating seed companies. These trials are conducted at the Vidalia Onion and Vegetable Research Center (VOVRC).

Materials and Methods

There were 50 varieties entered into the 2020 – 2021 trial. The seedbeds were grown at the VOVRC in Lyons, Georgia. Seedbed treatment included a 75 gallon per acre fumigation treatment of metam sodium. The seedbeds were planted on September 22, 2020 and the trial was transplanted on December 8, 2020. Upon harvest and grading, yield measurements are taken, and a 10 bulb sample of jumbo onions per plot is sent to the UGA Crop Quality Laboratory in Athens, Georgia, to undergo flavor testing. Seedbed and trial fertility, as well as pesticide applications are listed below. The trial evaluated all 50 varieties in 20 foot long by 6 foot wide plots. Each variety was replicated four times and harvested based on a committee decision of maturity. The plant population for the trial was equivalent to 87,120 plants per acre.

Seedbed Fertility:

300 lb/A of 10-10-10 applied September 21, 2020 (preplant incorporated)
200 lb/A of 10-10-10 applied September 23, 2020
200 lb/A of 10-10-10 applied October 14, 2020
200 lb/A of 10-10-10 applied October 28, 2020
100 lb/A of 10-10-10 applied November 2, 2020
Total lbs/A applied: 100 (N) – 100 (P) – 100 (K) – 120 (S)

Note: All fertilizer applications were applied with a First Products brand drop spreader.

Seedbed Pesticides Applied:

<u>Date</u>	<u>Product Applied</u>
August 11, 2020	Vapam HL (75 gal/A)
September 21, 2020	Lorsban (1 qt/A) preplant incorporated
September 22, 2020	Dacthal (4 pt/A)
October 27, 2020	Fontelis (16 oz/A) + Kocide 3000 (.75 lb/A)
November 3, 2020	Inspire Super (20 oz/A) + Kocide 3000 (.75 lb/A)

Trial Fertility:

300 lb/A of 5-10-15 applied December 16, 2020
300 lb/A of 5-10-15 applied January 11, 2021
300 lb/A of 5-10-15 applied February 4, 2021
128 lb/A of calcium nitrate applied February 25, 2021
178 lb/A of calcium nitrate applied March 9, 2021
Total lbs/A applied: 92.43 (N) – 90 (P) – 135(K) – 27 (S)

Note: Soil sample test results called for 125 -150 lb/A nitrogen, 60 lb/A of phosphorus, 90 lb/A of potash, and 40 – 60 lb/A of sulfur. All fertilizer applications were applied with a First Products brand drop spreader.

Fungicides Applied:

<u>Date</u>	<u>Fungicide Applied</u>
January 21, 2021	Mazate Pro-Stick (3 lb/A) + Kocide 3000 (.75 lb/A)
February 3, 2021	Luna Tranquility (27 oz/A) + Bravo Weather Stik (3 pt/A)
February 24, 2021	Miravis Prime (12 oz/A) + Quadris Top (14 oz/A)
March 8, 2021	Inspire Super (20 oz/A) + Lifegard WG (2 oz/A)
March 15, 2021	Bravo Weather Stik (3 pt/A) + Manzate Pro-Stick (3 lb/A) + Kocide 3000 (1.5 lb/A)
March 23, 2021	Kocide 3000 (1.5 lb/A) + Omega 500 (1 pt/A)
April 6, 2021	Kocide 3000 (1.5 lb/A) + Omega 500 (1 pt/A)
April 13, 2021	Kocide 3000 (1.5 lb/A) + Lifegard WG (2 oz/A) + Pristine (18.5 oz/A)

Insecticides Applied:

<u>Date</u>	<u>Product Applied</u>
December 16, 2020	Lorsban (1 qt/A)
March 8, 2021	Torac (24 oz/A)
March 15, 2021	Radiant (10 oz/A)
March 23, 2021	Torac (24 oz/A)
April 6, 2021	Radiant (10 oz/A)
April 13, 2021	Torac (24 oz/A)

Herbicides Applied:

<u>Date</u>	<u>Product Applied</u>
December 9, 2020	Goal 2XL (1 qt/A) + Prowl (1 qt/A)

Variety Entries in the 2020-2021 Trial

<u>Variety Name</u>	<u>Company</u>	<u>Type</u>
A1639	Hazera	Yellow Granex
Sivan	Hazera	Pink/Red
Miss Scarlet	Hazera	Red
Sweet Emotion	Clifton Seed	Yellow Granex
Fast Track	Clifton Seed	Yellow Granex
Quick Start	Clifton Seed	Yellow Granex
Sabrina	East-West Seed Co.	Yellow Granex
Superex	Takii	Yellow Granex
Rio Del Sol	Takii	Yellow Grano
Rio Dulce	Takii	Yellow Grano
WI-129	Wannamaker	Yellow Granex
New Frontier	Wannamaker	Yellow Granex
SON-109Y	Sakata	Yellow Granex
Candy Joy	Solar	Yellow Granex
Candy Ann	Solar	Yellow Granex
Candy Kim	Solar	Yellow Granex
Sapelo	DP Seeds	Yellow Granex
Miss Megan	DP Seeds	Yellow Granex
1407	DP Seeds	Yellow Granex
GA Boy	DP Seeds	Yellow Granex
Lucille	DP Seeds	Red
EMY 55045	Emerald	Yellow Granex
EMY 55126	Emerald	Yellow Granex
EMY 55455	Emerald	Yellow Granex
EMY 55457	Emerald	Yellow Granex
EMR 57357	Emerald	Red
NUN 1011	Nunhems	Yellow Granex
Vidora	Nunhems	Yellow Granex
Plethora	Nunhems	Yellow Granex
Vulkana	Nunhems	Yellow Globe
Sofire	Nunhems	Red
Mata Hari	Nunhems	Red
Dulciana	Nunhems	Yellow Grano
J3013	Bejo	Yellow Granex
Pirate	Bejo	Yellow Granex
Macon	Bejo	Yellow Granex
Tania	Bejo	Yellow Granex
Allison	Bejo	Yellow Granex
J3018	Bejo	Yellow Granex
Red Hunter	Bejo	Red
Monja Blanca	Bejo	White
Maragogi	Bejo	Yellow Granex
Red Sensation	Bejo	Red
Red Duke	Bejo	Red
Sweet Azalea	Seminis	Yellow Granex
Sweet Agent	Seminis	Yellow Granex
PRR	Seminis	Yellow Granex
Sweet Magnolia	Seminis	Yellow Granex
Century	Seminis	Yellow Granex
Red Maiden	Seminis	Red

Harvest Timing

Each variety was evaluated and selected for harvest based upon signs of weak tops and/or adequately sized bulbs. A committee of Extension Agents determined the harvest/pulling of varieties. Participating seed companies reserve the right to specify when or what characteristics determine the harvest of their variety. Varieties were clipped 7 days after their dig date. Growing Degree Days (GDD) aid us in forecasting harvest maturity for onions. A base temperature of 50°F is used in formulating GDD's accumulated.

Variety	Maturity	Planting Date	Dig Date	Days After Transplanting to Digging	GDD 50°F Base
Fast Track, Quick Start, WI-129, Candy Joy, Candy Ann, DP 1407	Very Early	December 8, 2020	April 6, 2021	119	674
Sweet Emotion, New Frontier, Candy Kim, Vidora, Sweet Agent, Vulkana,	Early	December 8, 2020	April 13, 2021	126	797
Sapelo, NUN 1011, Tania, Red Maiden, Sofire, Dulciana, Maragogi, Red Sensation	Medium	December 8, 2020	April 19, 2021	132	894
A1639, Sabrina, Emy 55126, Plethora, J3013, Pirate, J3018, Sivan, Miss Scarlet, Monja Blanca, Rio Dulce, EMR 57357, Red Duke	Med-Late	December 8, 2020	April 26, 2021	139	984
Superex, SON-109Y, GA Boy, Emy 55045, Emy 55455, Emy 55457, Macon, Allison, Sweet Azalea, PRR, Sweet Magnolia, Century, Rio Del Sol, Red Hunter, Lucille, Mata Hari	Late	December 8, 2020	May 3, 2021	146	1143

Results and Discussion

The following tables show field weights, marketable yields, colossal yields, jumbo yields, medium yields, and cull yield. For additional information regarding the performance of a given variety, please contact your Extension Agent or the Vidalia Onion and Vegetable Research Center. We would like to thank the participating seed companies as well as the Vidalia Onion Committee for their support of this trial.

Table 1. Vidalia onion **Field Weights** (40 lb. bags/acre) measured before grading.

Variety	Company	Total Yield 40 lb. bags/ acre	
Sweet Azalea	Seminis	1550	a
EMY 55457	Emerald	1527	ab
GA Boy	DP Seeds	1493	abc
Sweet Magnolia	Seminis	1457	abcd
Macon	Bejo	1449	abcde
Superex	Takii	1428	abcdef
Rio Del Sol	Takii	1421	abcdefg
EMY 55455	Emerald	1416	abcdefg
Lucille	DP Seeds	1416	abcdefg
Allison	Bejo	1405	abcdefgh
SON-109Y	Sakata	1376	abcdefghi
EMY 55045	Emerald	1358	abcdefghi
Mata Hari (red)	Nunhems	1353	abcdefghij
Plethora	Nunhems	1318	bcdefghijk
J3018	Bejo	1317	bcdefghijk
J3013	Bejo	1316	bcdefghijk
A1639	Hazera	1288	cdefghijkl
Miss Megan	DP Seeds	1264	defghijklm
Rio Dulce	Takii	1248	defghijklmn
EMY 55126	Emerald	1241	efghijklmno
Red Hunter (red)	Bejo	1234	efghijklmnop
Century	Seminis	1233	fghijklmnop
Monja Blanca	Bejo	1231	fghijklmnop
PRR	Seminis	1210	ghijklmnop
Sabrina	East-West	1200	hijklmnopq
Red Duke (red)	Bejo	1181	ijklmnopq
Pirate	Bejo	1179	ijklmnopq
Vidora	Nunhems	1141	jklmnopqr
Maragogi	Bejo	1126	klmnopqrs
NUN 1011	Nunhems	1111	klmnopqrs
Miss Scarlet	Hazera	1096	lmnopqrs
Red Sensation	Bejo	1065	mnopqrst
New Frontier	Wannamaker	1047	nopqrstu
Sapelo Sweet	DPSeeds	1031	opqrstuv
Candy Kim	Solar	1021	pqrstuv
Tania	Bejo	1021	pqrstuv
1407	DPSeeds	995	qrstuvw
Sweet Emotion	Shamrock	939	rstuvw
Dulciana	Nunhems	936	rstuvw
Candy Ann	Solar	932	rstuvw
WI-129	Wannamaker	925	stuvw
Sweet Agent	Seminis	864	tuvw
Red Maiden	Seminis	839	vwxy
Sivan	Hazera	818	vwxy
Fast Track	Shamrock	804	wxy
Candy Joy	Solar	797	wxy
Sofire (red)	Nunhems	782	wxy
EMY 57357	Emerald	768	xy
Quick Start	Shamrock	753	xy
Vulkana	Nunhems	647	y

* Letters that are the same between varieties indicate that those varieties are not significantly different according to Tukey test ($P \leq 0.05$).

Table 2. Vidalia onion **Total Marketable Yield** (40 lb. bags/acre) measured after grading.

Variety	Total Yield 40 lb. bags/ acre	
EMY 55457	1406.625	a
Macon	1331.7562	ab
Rio Del Sol	1315.875	abc
Lucille	1295.4563	abc
GA Boy	1247.8125	abcd
Mata Hari	1236.4688	abcd
Sweet Azalea	1236.4688	abcd
Sweet Magnolia	1202.4375	abcde
J3013	1179.75	abcdef
A1639	1168.4063	abcdef
Plethora	1157.0625	abcdef
EMY 55455	1154.7938	abcdef
Superex	1150.2563	abcdef
Rio Dulce	1147.9875	abcdef
J3018	1129.8375	abcdef
Allison	1123.0313	bcdefg
EMY 55045	1118.4938	bcdefg
Monja Blanca	1111.6875	bcdefg
Red Hunter	1102.6125	bcdefg
Vidora	1084.4625	bcdefg
NUN 1011	1082.1938	bcdefg
SON-109Y	1068.5813	bcdefgh
EMY 55126	1066.3125	bcdefgh
Sabrina	1059.5063	bcdefghi
Miss Megan	1050.4313	cdefghij
Red Sensation	1016.4	defghijk
Maragogi	1009.5938	defghijkl
Red Duke	993.7125	defghijkl
Tania	934.725	efghijklm
Sapelo Sweet	923.3813	fghijklm
Miss Scarlet	914.3063	fghijklm
Pirate	907.5	fghijklmn
Dulciana	905.2313	fghijklmn
PRR	868.9313	ghijklmno
Candy Kim	803.1375	hijklmno
New Frontier	787.2563	ijklmnop
1407	778.1813	jklmnop
Candy Ann	750.9563	klmnop
Century	735.075	lmnop
Red Maiden	710.1188	mnop
Sweet Agent	703.3125	mnop
WI-129	701.0438	mnop
Sofire	678.3563	mnopq
Fast Track	673.8188	mnopq
Candy Joy	635.25	nopq
Sivan	626.175	opq
EMY 57357	601.2188	opq
Quick Start	592.1438	opq
Sweet Emotion	533.1563	pq
Vulkana	408.375	q

* Letters that are the same between varieties indicate that those varieties are not significantly different according to Tukey test ($P \leq 0.05$).

Table 3. Vidalia onion **Colossal** yield (40 lb. bags/acre) measured after grading.

Variety	Total Yield	
	40 lb. bags/ acre	
GA Boy	184	a
Rio Del Sol	136	ab
Sweet Magnolia	136	ab
Century	120	abc
Miss Megan	93	bcd
Sweet Azalea	93	bcd
Macon	86	bcd
EMY 55455	86	bcd
Lucille	68	cde
EMY 55457	68	cde
EMY 55045	64	cdef
Allison	61	cdef
PRR	54	cdef
Plethora	48	def
SON-109Y	45	def
Superex	45	def
Pirate	34	def
Mata Hari	18	ef
J3018	18	ef
Red Hunter	14	ef
Miss Scarlet	9	ef
J3013	7	ef
Red Duke	5	ef
Fast Track	2	ef
Monja Blanca	2	ef
Sabrina	2	ef
New Frontier	2	ef
NUN 1011	2	ef
Rio Dulce	2	ef
Sapelo Sweet	2	ef
Vulkana	2	ef
Tania	2	ef
Vidora	2	ef
A1639	2	ef
Candy Ann	2	ef
EMY 55126	2	ef
EMY 57357	0	f
Maragogi	0	f
Quick Start	0	f
Red Maiden	0	f
Red Sensation	0	f
Sivan	0	f
Sofire	0	f
1407	0	f
Dulciana	0	f
Sweet Agent	0	f
Candy Joy	0	f
Candy Kim	0	f
Sweet Emotion	0	f
WI-129	0	f

* Letters that are the same between varieties indicate that those varieties are not significantly different according to Tukey test ($P \leq 0.05$).

Table 4. Vidalia onion **Jumbo** yield (40 lb. bags/acre) measured after grading.

Variety	Total Yield	
	40 lb. bags/ acre	
EMY 55457	1302	a
Macon	1180	ab
Lucille	1155	abc
Mata Hari	1130	abcd
Sweet Azalea	1114	abcde
J3013	1114	abcde
A1639	1098	abcde
Superex	1078	abcdef
Plethora	1062	abcdef
Rio Del Sol	1044	abcdef
J3018	1041	abcdef
Rio Dulce	1041	abcdef
Sweet Magnolia	1023	abcdefg
EMY 55455	1019	abcdefg
Allison	1005	abcdefgh
GA Boy	1005	abcdefgh
EMY 55126	1003	bcdefgh
Monja Blanca	994	bcdefgh
EMY 55045	991	bcdefgh
Sabrina	987	bcdefgh
Red Hunter	966	bcdefghi
SON-109Y	955	bcdefghij
Vidora	951	bcdefghij
Miss Megan	883	bcdefghijk
Maragogi	880	cdefghijk
NUN 1011	878	cdefghijk
Red Duke	878	cdefghijk
Pirate	851	defghijk
Miss Scarlet	819	efghijkl
Red Sensation	794	fghijkl
Tania	787	fghijklm
PRR	783	fghijklm
Sapelo Sweet	728	ghijklmn
Dulciana	710	hijklmn
Candy Kim	678	ijklmno
New Frontier	662	ijklmno
1407	601	klmnop
Century	588	klmnop
Candy Ann	538	lmnopq
Sweet Agent	495	mnopq
Sivan	476	nopq
Sofire	467	nopq
WI-129	463	nopq
EMY 57357	458	nopq
Sweet Emotion	438	nopq
Fast Track	433	nopq
Red Maiden	395	opq
Quick Start	358	pq
Candy Joy	336	pq
Vulkana	284	q

* Letters that are the same between varieties indicate that those varieties are not significantly different according to Tukey test ($P \leq 0.05$).

Table 5. Vidalia onion **Medium** yield (40 lb. bags/acre) measured after grading.

Variety	Total Yield 40 lb. bags/ acre	
Red Maiden	315	a
Candy Joy	299	ab
WI-129	238	abc
Fast Track	238	abc
Quick Start	234	abcd
Red Sensation	222	abcde
Candy Ann	211	bcdef
Sofire	211	bcdef
Sweet Agent	209	bcdef
NUN 1011	202	bcdefg
Dulciana	195	cdefgh
Sapelo Sweet	193	cdefgh
1407	177	cdefghi
Sivan	150	cdefghij
Tania	145	cdefghijk
EMY 57357	143	cdefghijk
Rio Del Sol	136	cdefghijkl
Vidora	132	defghijklm
Maragogi	129	efghijklmn
Candy Kim	125	efghijklmno
New Frontier	123	fghijklmno
Vulkana	123	fghijklmno
Red Hunter	123	fghijklmno
Monja Blanca	116	fghijklmno
Red Duke	111	fghijklmno
Rio Dulce	104	ghijklmno
Sweet Emotion	95	hijklmno
Mata Hari	88	ijklmno
Miss Scarlet	86	ijklmno
Miss Megan	75	ijklmno
Lucille	73	jklmno
J3018	70	jklmno
Sabrina	70	jklmno
SON-109Y	68	jklmno
A1639	68	jklmno
Macon	66	jklmno
EMY 55045	64	jklmno
EMY 55126	61	jklmno
GA Boy	59	jklmno
J3013	59	jklmno
Allison	57	jklmno
EMY 55455	50	jklmno
Plethora	48	jklmno
Sweet Magnolia	43	klmno
EMY 55457	36	lmno
PRR	32	mno
Sweet Azalea	29	mno
Superex	27	no
Century	27	no
Pirate	23	o

* Letters that are the same between varieties indicate that those varieties are not significantly different according to Tukey test ($P \leq 0.05$).

Table 6. Vidalia onion **Cull** yield (40 lb. bags/acre) measured after grading.

Variety	Total Yield 40 lb. bags/ acre	
Century	498	a
Sweet Emotion	406	ab
PRR	341	abc
Sweet Azalea	313	abcd
SON-109Y	307	bcde
Allison	282	bcdef
Superex	278	bcdef
Pirate	271	bcdefg
Red Duke	265	bcdefgh
EMY 55455	261	bcdefg
New Frontier	260	bcdefg
Sweet Magnolia	254	bcdefgh
GA Boy	245	bcdefgh
EMY 55045	239	bcdefghi
Vulkana	238	bcdefghi
WI-129	223	bcdefghij
Candy Kim	218	cdefghij
1407	217	cdefghij
Miss Megan	213	cdefghijk
Sivan	192	cdefghijk
J3018	187	cdefghijk
Candy Ann	182	cdefghijk
Miss Scarlet	182	cdefghijk
EMY 55126	175	cdefghijk
EMY 57357	167	cdefghijk
Candy Joy	162	cdefghijk
Plethora	161	cdefghijk
Sweet Agent	161	cdefghijk
Quick Start	161	cdefghijk
Sabrina	141	defghijk
J3013	136	defghijk
Red Hunter	132	defghijk
Fast Track	130	defghijk
Red Maiden	129	defghijk
EMY 55457	120	efghijk
Lucille	120	efghijk
A1639	119	fghijk
Monja Blanca	119	fghijk
Macon	117	fghijk
Maragogi	117	fghijk
Mata Hari	117	fghijk
Sapelo Sweet	108	fghijk
Rio Del Sol	105	fghijk
Sofire	103	fghijk
Rio Dulce	100	fghijk
Tania	86	ghijk
Vidora	57	ijk
Dulciana	51	hijk
Red Sensation	49	jk
NUN 1011	28	k

* Letters that are the same between varieties indicate that those varieties are not significantly different according to Tukey test ($P \leq 0.05$).

UGA Variety Trial Quality Report 2020 – 2021 Crop Season

J. Lessl, D. Jackson, C. Tyson, J. Edenfield, R. Greene, A. Shirley, A. Bateman, D. Thigpen, D. Clark, S. Powell, S. Tanner, and D. Bowen

Introduction

Each season the University of Georgia, Agricultural and Environmental Services Laboratories evaluates the flavor-associated compounds in the short-day onions grown in the Variety Trial. These onion varieties are submitted by the participating seed companies, grown at the Vidalia Onion and Vegetable Research Center (VOVRC), and once harvested and dried, submitted to the Agricultural and Environmental Services Laboratories for analysis of the pungency-related compounds; pyruvic acid, lachrymatory factor (LF), and methyl thiosulfinates. Due to association of Vidalia onions with low pungency and sweet flavor, this annual evaluation provides useful information about the relative flavor quality of these onion varieties.

This publication summarizes the flavor analysis results from the 2020-2021 growing season, as well as compares the performance of each variety over the past three growing seasons.

Materials and methods

Fifty onion varieties were analyzed as part of the 2020 – 2021 variety trial. Each variety was grown at the VOVRC in quadruplicate plots. Harvested onions from each plot were dried and submitted to the lab individually. Cores were taken from 10 onions within each replicate, composited, and pressed to collect the onion juice which was analyzed following the procedures described in Kim *et al.* 2017¹.

Results and Discussion

The following tables compare the concentrations of flavor-associated compounds in onions grown as a part of the 2020-2021 variety trial. It should be noted that as the three measured parameters decrease, the onions are considered to have a more superior flavor quality. In this year's trials, the pyruvic acid (pungency) content ranged from 1.99-4.19 $\mu\text{mol/mL}$, which is a decrease of 35% compared to the last past two growing seasons. Lachrymatory factor ranged from 1.41-5.27 $\mu\text{mol/mL}$, which was consistent with the past two seasons. Finally, methyl thiosulfinates ranged from 6.4-46 nmol/mL with an overall decrease of 10% compared to the last two growing seasons. Overall, the quality results in the 2021 onion crop saw a 14% improvement (decline in overall quality parameters) as compared to the past two seasons. This could be attributed to a milder, wetter, more favorable growing season along with a 25% reduction in sulfur fertilizer applied (from 36 to 27 lbs/A). The cumulative variety flavor quality rankings are also provided below for this year's data along with the average rating of yellow onion varieties grown over the past three seasons. For additional information regarding the performance of a given variety, please contact your Extension Agent or the Vidalia Onion and Vegetable Research Center. We would like to thank the participating seed companies as well as the Vidalia Onion Committee for their support of this trial.

References

¹Kim H, Jackson D, Adhikari K, Riner C, & Sanchez-Brambila G. 2017. "Relationship between consumer acceptability and pungency-related flavor compounds of Vidalia onions", *Journal of Food Science*. 82 (10): 2396-2402.

Table 1. Pungency (pyruvic acid) content in onions submitted to the UGA Agricultural & Environmental Services Labs as a part of the 2020-2021 variety trial.

Variety	Pyruvic Acid (μ mole/mL)	
Monja Blanca	1.99	a
Red Hunter	2.22	ab
WI-129	2.50	abc
J3018	2.68	abcd
Sweet Magnolia	2.69	abcd
Candy Joy	2.70	abcd
Vidora	2.71	abcd
Sweet Azalea	2.75	abcde
New Frontier	2.92	abcdef
XON-109Y	2.95	abcdefg
Sweet Agent	2.99	abcdefg
Pirate	3.01	abcdefg
Candy Kim	3.09	abcdefg
EMY 55457	3.14	abcdefg
Red Sensation	3.15	abcdefg
Macon	3.17	abcdefg
Red Duke	3.19	abcdefg
Candy Ann	3.19	abcdefg
Quick Start	3.19	abcdefg
Century	3.20	abcdefg
Allison	3.21	abcdefg
Fast Track	3.21	abcdefg
Sivan	3.24	bcdefg
Superex	3.26	bcdefg
EMY 55455	3.26	bcdefg
Miss Megan	3.27	bcdefg
EMY 55045	3.29	bcdefg
Plethora	3.30	bcdefg
1407	3.32	bcdefg
Sweet Emotion	3.35	bcdefg
GA Boy	3.38	bcdefg
EMY 57357	3.40	bcdefg
J3013	3.43	bcdefg
EMY 55126	3.45	bcdefg
NUN 1011	3.48	cdefg
Rio Dulce	3.48	cdefg
Miss Scarlet	3.53	cdefg
Tania	3.55	cdefg
Maragogi	3.57	cdefg
Dulciana	3.64	cdefg
Rio Del Sol	3.69	cdefg
Mata Hari	3.69	cdefg
Vulkana	3.78	defg
Sapelo Sweet	3.81	defg
Sabrina	3.85	defg
PRR	3.88	defg
Lucille	3.91	defg
A1639	3.97	efg
Red Maiden	4.01	fg
Sofire	4.19	g

**Similar letters between varieties indicate those varieties are not significantly different according to Tukey test ($P \leq 0.05$).*

Table 2. Onion lachrymatory factor (propanethial S-oxide) content in onions submitted to the UGA Agricultural & Environmental Services Labs as a part of the 2020-2021 variety trial.

Variety	Lachrymatory Factor ($\mu\text{mole/mL}$)	
Red Hunter	1.41	a
Monja Blanca	1.72	ab
Century	2.18	abc
Sweet Magnolia	2.23	abc
Sweet Azalea	2.60	abcd
Rio Del Sol	2.61	abcd
EMY 55457	2.71	abcde
Superex	2.74	abcde
Sivan	2.88	abcde
Candy Joy	2.90	abcde
Plethora	2.94	abcde
Red Sensation	3.02	abcde
Pirate	3.02	abcde
Candy Ann	3.07	abcde
Red Duke	3.13	abcde
Fast Track	3.13	abcde
Maragogi	3.16	abcde
WI-129	3.16	abcde
Macon	3.19	abcde
XON-109Y	3.20	abcde
New Frontier	3.28	abcdef
J3018	3.29	abcdef
Allison	3.31	abcdef
Tania	3.41	abcdef
Lucille	3.51	bcdef
NUN 1011	3.51	bcdef
Miss Scarlet	3.53	bcdef
EMY 55045	3.56	bcdef
Sweet Emotion	3.59	bcdef
Quick Start	3.60	bcdef
Dulciana	3.62	bcdef
PRR	3.68	bcdef
Sweet Agent	3.69	bcdef
Vidora	3.71	bcdef
Rio Dulce	3.73	cdef
EMY 55455	3.87	cdef
Miss Megan	3.91	cdef
EMY 57357	3.93	cdef
Candy Kim	3.95	cdef
Red Maiden	4.02	cdef
Sapelo Sweet	4.17	cdef
EMY 55126	4.18	cdef
GA Boy	4.24	def
1407	4.37	def
J3013	4.46	def
Sofire	4.58	def
A1639	4.58	def
Mata Hari	4.69	ef
Sabrina	4.71	ef
Vulkana	5.27	f

**Similar letters between varieties indicate those varieties are not significantly different according to Tukey test ($P \leq 0.05$).*

Table 3. Methyl thiosulfinate content in onions submitted to the UGA Agricultural & Environmental Services Labs as a part of the 2020-2021 variety trial.

Variety	Methyl thiosulfinates (nmole/mL)	
Sweet Magnolia	6.4	a
Sweet Azalea	7.4	ab
Dulciana	10.0	abc
Red Hunter	10.8	abc
Monja Blanca	10.9	abcd
EMY 55045	11.6	abcde
Plethora	11.8	abcde
EMY 57357	12.7	abcde
PRR	13.0	abcde
Superex	13.2	abcde
GA Boy	14.1	abcde
Allison	14.5	abcdef
Vulkana	14.6	abcdef
EMY 55126	15.3	abcdefg
EMY 55455	15.4	abcdefg
Miss Megan	15.4	abcdefg
J3013	15.7	abcdefg
Century	15.8	abcdefg
Red Duke	16.4	abcdefg
XON-109Y	17.7	abcdefg
A1639	18.1	abcdefg
Red Sensation	18.1	abcdefg
Vidora	18.2	abcdefg
EMY 55457	18.8	abcdefg
Rio Del Sol	19.1	abcdefg
Pirate	19.3	abcdefg
J3018	20.1	abcdefgh
NUN 1011	20.9	abcdefghi
Rio Dulce	21.1	abcdefghi
Red Maiden	21.6	abcdefghi
Sweet Agent	22.8	abcdefghi
Macon	24.6	abcdefghij
Mata Hari	25.3	abcdefghij
Miss Scarlet	25.7	abcdefghij
Maragogi	25.8	abcdefghij
Sabrina	25.9	abcdefghij
WI-129	26.7	abcdefghij
Sofire	26.7	abcdefghij
Tania	27.4	abcdefghij
Lucille	27.8	abcdefghij
Sapelo Sweet	28.6	abcdefghij
Sweet Emotion	30.5	bcdefghij
Candy Kim	31.9	cdefghij
New Frontier	34.1	defghij
Sivan	34.4	efghij
Fast Track	37.6	fghij
1407	38.4	ghij
Candy Joy	43.1	hij
Quick Start	43.3	ji
Candy Ann	46.8	j

**Similar letters between varieties indicate those varieties are not significantly different according to Tukey test ($P \leq 0.05$).*

Table 4. Overall flavor quality ranking of the 2020-2021 variety trial onions ranked on lowest Pyruvic acid, Lachrymatory factor, and Methyl Thiosulfinates.

Variety	Rank	Variety	Rank	Variety	Rank
Monja Blanca	1 (t)	Dulciana	15 (t)	Sweet Emotion	30 (t)
Red Hunter	1 (t)	EMY 57357	15 (t)	Tania	30 (t)
Sweet Magnolia	3	Macon	15 (t)	Candy Kim	37 (t)
Sweet Azalea	4	Rio Del Sol	15 (t)	J3013	37 (t)
Century	5	Candy Joy	22 (t)	Miss Scarlet	37 (t)
WI-129	6	EMY 55126	22 (t)	Lucille	40 (t)
Plethora	7 (t)	EMY 55455	22 (t)	Candy Ann	41 (t)
J3018	7 (t)	Maragogi	22 (t)	Sapelo Sweet	41 (t)
Vidora	7 (t)	Miss Megan	22 (t)	A1639	43 (t)
Red Duke	10 (t)	New Frontier	22 (t)	Quick Start	43 (t)
Red Sensation	10 (t)	PRR	22 (t)	Red Maiden	43 (t)
XON-109Y	10 (t)	Sweet Agent	22 (t)	Mata Hari	46 (t)
Superex	10 (t)	Fast Track	30 (t)	Vulkana	46 (t)
Allison	14 (t)	GA Boy	30 (t)	Sabrina	48
EMY 55045	14 (t)	NUN 1011	30 (t)	1407	49
EMY 55457	14 (t)	Rio Dulce	30 (t)	Sofire	50
Pirate	14 (t)	Sivan	30 (t)		

Table 5. Overall flavor quality ranking of yellow variety trial onions grown in three consecutive years (2019-2021) ranked in order of lowest overall Pyruvic acid, Lachrymatory factor, and Methyl Thiosulfinates. Only those yellow varieties with data from all three growing seasons were included in the table.

Variety	Rank	Variety	Rank
Sweet Magnolia	1	PRR	13(t)
Sweet Azalea	2	WI-129	13(t)
Century	3	New Frontier	13(t)
Plethora	4	Tania	13(t)
Alison	5(t)	Vulkana	13(t)
XON 109Y	5(t)	Candy Joy	19(t)
Sweet Agent	5(t)	Candy Kim	19(t)
Dulciana	5(t)	Sweet Emotion	19(t)
Macon	5(t)	Candy Ann	22(t)
Vidora	5(t)	Fast Track	22(t)
EMY 55126	5(t)	1407	24(t)
Pirate	12	Quick Start	24(t)
EMY 55455	13(t)	Sapelo	26