

## ***UGA Variety Trial Report 2019 – 2020 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 45 varieties entered into the 2019 – 2020 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 16, 2019, and the trial was transplanted on November 13, 2019. Upon harvest and grading, one bag of jumbo onions per plot is sent to the Vidalia Onion Research Lab in Tifton, Georgia, to undergo controlled atmospheric storage conditions. The storage duration is carried out until September 15, 2019. Seedbed and trial fertility, as well as fungicide programs are listed below. The trial evaluated all 45 varieties in 25 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:**

700 lb/A of 5-10-15 applied September 9, 2019 (preplant incorporated)  
200 lb/A of 10-10-10 applied September 30, 2019  
200 lb/A of 10-10-10 applied October 7, 2019  
200 lb/A of 10-10-10 applied October 28, 2019  
Total lbs/A applied: 95 (N) – 130 (P) – 165 (K) – 57 (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 8	Vapam HL (75 gal/A)
September 9	Lorsban (1 qt/A) preplant incorporated
September 17	Dacthal (4 pt/A) + Diazinon (2 qt/A)
October 20	Pristine (18.5 oz/A) + Magna-Bon (12 oz/A)
November 1	Inspire Super (20 oz/A) + Magna-Bon (12 oz/A)
November 9	Pristine (18.5 oz/A) + Magna-Bon (12 oz/A)

**Trial Fertility:**

400 lb/A of 5-10-15 applied October 31, 2019 (preplant incorporated)

200 lb/A of 5-10-15 applied November 27, 2019

200 lb/A of 5-10-15 applied December 18, 2019

400 lb/A of 5-10-15 applied January 8, 2020

100 lb/A of calcium nitrate applied February 24, 2020

150 lb/A of calcium nitrate applied March 9, 2020

Total lbs/A applied: 98.5 (N) – 120 (P) – 180 (K) – 36 (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.*

**Trial Fungicide Schedule:**

<u>Date</u>	<u>Fungicide Applied</u>
January 15	Luna Tranquility (27 oz/A)
January 22	Quadris Top (14 oz/A) + Magna-Bon (12 oz/A)
January 29	Miravis Prime (12 oz/A) + Kocide 3000 (.75 lb/A)
February 5	Inspire Super (20 oz/A) + ProPhyte (2 qt/A)
February 12	Merivon (11 oz/A) + Bravo (3 pt/A)
February 19	Inspire Super (20 oz/A) + Bravo (3 pt/A)
February 26	Fontelis (24 oz/A) + Kocide 3000 (.75 lb/A)
March 11	Miravis Prime (12 oz/A) + Kocide 3000 (.75 lb/A)
March 18	Orondis Ultra (8 oz/A) + Omega 500 (16 oz/A) + Magna-Bon (12 oz/A)
March 25	Miravis Prime (12 oz/A) + Magna-Bon (12 oz/A)

**Other Pesticide Applications:**

<u>Date</u>	<u>Product Applied</u>
November 1	Lorsban (1 qt/A) preplant incorporated
November 14	Goal 2XL (1 qt/A) + Prowl (1 qt/A)
February 3	Exirel (21 oz/A)
February 24	Radiant (10 oz/A)
March 9	Radiant (10 oz/A)

## **Harvest Timing**

Each variety was evaluated and selected for harvest based upon signs of weak tops and 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 dug 7 days prior to harvest date.

- April 7** Candy Joy, Fast Track, Quick Start
- April 14:** Candy Kim, New Frontier, Vidora, DP 1407, Candy Ann,
- April 21:** Sweet Agent, WI-129, Sweet Emotion, Rio Dulce, J3009, Sofire, Dulciana, Vulkana, Althea
- April 28:** Tania (J3013), J3014, Sweet Harvest, Plethora, 2002-Nunhems, DP Sapelo Sweet, Red Sensation, Pirate, Hazera 3662
- May 5:** Sabrina, NT-AC0901, Super Ex, Emy 55126, Georgia Boy, Alison, Emy 55455, Sweet Magnolia, Century, Emy 55457, Sweet Azalea, Sweet Jasper, Macon, Granex Yellow PRR, SON-109Y, Lucille, Red Hunter, Mata Hari, Red Duke

## **Production Issues in 2020**

Yields and quality were significantly lower than average for many varieties this year. Here are some the issues that contributed:

**Bolting** – There was a high incidence of bolting in the trial that reduced yield. Counts were taken on April 3<sup>rd</sup> as harvest began. At that time, counts in some varieties were 10 – 30% bolted (See table). However, many varieties continued to bolt until harvest, and this late bolting reduced yields even further. At harvest, some varieties were 50% bolted.

**Hail Damage** – A hail storm occurred at the Vidalia Onion and Vegetable Research Center on April 8, 2020. High winds accompanied the hail storm and damaged the onions that had not been harvested. The hail caused significant bruising of onion tissue, along with puncture wounds to the leaves.



*A picture of hail damage at the Vidalia Onion and Vegetable Research Center taken on April 10, 2020, two days after the storm. Notice the severe bruising to the entire leaf with a few puncture wounds.*

**Bacterial Disease Issues at Harvest** – Internal bacterial rots occurred at a very high percentage in onions harvested after April 15<sup>th</sup>. Many of the varieties harvested after this time had marketable yields below 500 bags/acre. Samples from culls indicate that several pathogens were to blame. *Pantoea spp.*, the causal agent of Center Rot, and *Burkholderia spp.*, the causal agent of Sour Skin and Slippery Skin, were identified as the major contributors to the internal rot. Many of the onions affected had wet necks. In some instances, this internal rot was only detectable by cutting the onion open and inspecting it.



*A photo of internal decay found on the grading line at the Research Center. This onion showed no external symptoms of disease. The pathogen causing this decay is believed to be from *Burkholderia spp.*, which is responsible for Sour Skin and Slippery Skin disease of onion.*



**COVID-19 and Onion Harvest** – The 2020 harvest season brought unique challenges for the Vidalia Onion and Vegetable Research Center. The COVID-19 crisis coincided directly with harvest and grading of the variety trial. The inmates from Rogers State Prison that normally provide this labor were not allowed out of the prison due to quarantine. So with no labor available to harvest and grade, a plan was made for the county agents to safely harvest and grade the trial themselves, while practicing social distancing. Instead of harvesting entire plots, a 5 foot sample from each 25 foot plot was harvested and graded. County agents practiced social distancing in the field and grading shed by keeping a minimum 6 foot distance from others while working. The county agent crew harvested the variety trial over a period of 6 weeks, meeting twice per week to pull, clip, dry, and grade onions as they matured. Over 500 hours of volunteer manpower was logged in order harvest this trial. Many thanks to this hardworking group for making this trial a success!



*COVID-19 brought many challenges to onion harvest and grading. Labor was not available for harvest, so county agents harvested and graded onions while maintaining social distancing. Pictured here at the onion grader are: (l-r) Aubrey Shirley – Tattnall County, Savannah Tanner – Emanuel County, Jason Edenfield – Toombs County, Derrick Bowen – Tattnall County. Not pictured: Steven Powell, Treutlen County.*

## **Results and Discussion**

The following tables show field weights, marketable yields, colossal yields, jumbo yields, and medium yields. There is also information about cull weights, seed stem counts, and grading notes. 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 total yield (40 lb. bags/acre) measured before grading.

Rank	Variety	Total yield	
1	Sweet Emotion	1169	a
2	Macon	1097	a
3	Mata Hari	1059	ab
4	New Frontier	1021	abc
5	Candy Kim	1004	abc
6	Candy Ann	1004	abc
7	2002	999	abc
8	Sweet Agent	999	abc
9	Sweet Magnolia	970	abcd
10	1407	966	abcd
11	WI-129	966	abcd
12	Century	932	abcd
13	Althea	932	abcd
14	Quick Start	927	abcd
15	Sofire	923	abcd
16	Rio Dulce	923	abcd
17	Fast Track	868	abcde
18	Hazera 3662	868	abcde
19	Allison	864	abcde
20	Red Hunter	860	abcde
21	Dulciana	860	abcde
22	J3009	855	abcde
23	Sapelo	817	abcdef
24	Vulkana	817	abcdef
25	Candy Joy	788	abcdef
26	Superex	779	abcdef
27	Sweet Harvest	771	abcdef
28	Emy55455	762	abcdefg
29	Sweet Azalea	750	abcdefg
30	Granex Yellow PRR	737	abcdefg
31	Red Duke	737	abcdefg
32	Vidora	711	abcdefg
33	Sweet Jasper	695	abcdefg
34	Plethora	682	abcdefg
35	Tania (J3013)	678	abcdefg
36	Pirate	673	abcdefg
37	Bejo J3014	576	bcdefg
38	GA Boy	534	cdefg
39	SON-109Y	529	cdefg
40	NT-AC0901	491	defg
41	Red Sensation	381	efg
42	Sabrina	368	efg
43	Emy55457	347	fg
44	EMY 55126	339	fg
45	Lucille	263	g



Table 2. Vidalia onion marketable yield (40 lb. bags/acre) measured after grading.

<b>Rank</b>	<b>Variety</b>	<b>Marketable yield</b>	
1	2002	932	a
2	Althea	881	ab
3	Rio Dulce	868	ab
4	New Frontier	834	abc
5	Sofire	813	abc
6	Candy Kim	800	abcd
7	Quick Start	783	abcde
8	1407	771	abcde
9	Macon	767	abcde
10	Fast Track	754	abcde
11	Sweet Emotion	745	abcdef
12	Sweet Agent	728	abcdef
13	Dulciana	728	abcdef
14	Candy Ann	699	abcdef
15	J3009	669	abcdefg
16	Candy Joy	661	abcdefg
17	Mata Hari	614	abcdefgh
18	Tania (J3013)	614	abcdefgh
19	Hazera 3662	606	abcdefghi
20	Sapelo	593	abcdefghi
21	Vidora	593	abcdefghi
22	Red Hunter	580	abcdefghi
23	WI-129	576	abcdefghi
24	Superex	542	abcdefghi
25	Pirate	521	abcdefghi
26	Allison	500	abcdefghi
27	Emy55455	495	abcdefghi
28	Vulkana	491	abcdefghi
29	Red Duke	453	abcdefghi
30	Plethora	445	abcdefghi
31	Bejo J3014	440	abcdefghi
32	Century	436	abcdefghi
33	Granex Yellow PRR	415	bcdefghi
34	Sweet Magnolia	390	bcdefghi
35	Sweet Harvest	347	cdefghi
36	Red Sensation	339	cdefghi
37	Sweet Azalea	305	defghi
38	GA Boy	301	defghi
39	NT-AC0901	280	efghi
40	SON-109Y	246	fghi
41	Sabrina	186	ghi
42	Sweet Jasper	178	ghi
43	Lucille	152	hi
44	EMY 55126	106	i
45	Emy55457	106	i

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

Rank	Variety	Colossal	
1	Sweet Emotion	212	a
2	Sweet Agent	195	ab
3	Allison	169	ab
4	Macon	152	abc
5	New Frontier	144	abc
6	Emy55455	136	abcd
7	NT-AC0901	127	abcde
8	Sweet Magnolia	127	abcde
9	Candy Ann	114	abcde
10	Bejo J3014	102	abcde
11	Sweet Azalea	102	abcdef
12	Tania (J3013)	102	abcdef
13	Mata Hari	85	abcdef
14	Superex	85	abcdef
15	Century	76	abcdefg
16	GA Boy	76	abcdefg
17	Red Sensation	76	abcdefgh
18	2002	68	abcdefgh
19	Red Duke	68	abcdefghi
20	Plethora	68	abcdefghi
21	1407	59	abcdefghi
22	J3009	59	abcdefghi
23	Pirate	59	abcdefghi
24	Rio Dulce	59	abcdefghi
25	SON-109Y	59	abcdefghi
26	Sweet Harvest	59	abcdefghi
27	Candy Kim	51	abcdefghi
28	Granex Yellow PRR	34	abcdefghi
29	Lucille	34	abcdefghi
30	Sofire	34	abcdefghi
31	Vidora	34	abcdefghi
32	WI-129	34	abcdefghi
33	EMY 55126	25	bcdefghi
34	Dulciana	25	bcdefghi
35	Hazera 3662	25	cdefghi
36	Red Hunter	25	cdefghi
37	Sapelo	25	defghi
38	Vulkana	17	defghi
39	Sabrina	13	efghi
40	Althea	0	fghi
41	Candy Joy	0	ghi
42	Emy55457	0	ghi
43	Fast Track	0	hi
44	Quick Start	0	i
45	Sweet Jasper	0	i

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

<b>Rank</b>	<b>Variety</b>	<b>Jumbo yield</b>	
1	2002	847	a
2	Althea	822	ab
3	Rio Dulce	788	ab
4	Quick Start	762	abc
5	Sofire	762	abc
6	Candy Kim	711	abcd
7	Fast Track	695	abcde
8	1407	678	abcde
9	Dulciana	661	abcde
10	New Frontier	661	abcde
11	Macon	601	abcdef
12	J3009	593	abcdef
13	Candy Joy	576	abcdef
14	Candy Ann	572	abcdef
15	Sapelo	551	abcdefg
16	Vidora	534	abcdefg
17	Hazera 3662	525	abcdefgh
18	WI-129	517	abcdefgh
19	Sweet Emotion	517	abcdefghi
20	Sweet Agent	508	abcdefghi
21	Mata Hari	508	abcdefghi
22	Red Hunter	508	abcdefghi
23	Tania (J3013)	508	abcdefghi
24	Pirate	449	abcdefghi
25	Superex	432	abcdefghi
26	Vulkana	424	abcdefghi
27	Granex Yellow PRR	373	abcdefghi
28	Plethora	373	abcdefghi
29	Red Duke	373	abcdefghi
30	Century	356	abcdefghi
31	Emy55455	347	abcdefghi
32	Bejo J3014	339	abcdefghi
33	Allison	322	bcdefghi
34	Sweet Harvest	275	bcdefghi
35	Red Sensation	254	cdefghi
36	Sweet Magnolia	246	cdefghi
37	GA Boy	220	defghi
38	Sweet Azalea	195	defghi
39	SON-109Y	186	efghi
40	Sweet Jasper	178	fghi
41	Sabrina	169	ghi
42	NT-AC0901	144	ghi
43	Lucille	119	hi
44	Emy55457	102	i
45	EMY 55126	76	i

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

Rank	Variety	Medium yield	
1	Candy Joy	85	a
2	Althea	59	ab
3	Fast Track	59	ab
4	Hazera 3662	55	abc
5	Vulkana	51	abc
6	Red Hunter	47	abcd
7	Dulciana	42	abcde
8	Candy Kim	38	abcde
9	1407	34	abcde
10	New Frontier	30	abcde
11	Superex	25	abcdef
12	Sweet Agent	25	abcdef
13	Vidora	25	abcdef
14	WI-129	25	abcdef
15	Mata Hari	21	abcdefg
16	Quick Start	21	abcdefg
17	Rio Dulce	21	abcdefgh
18	2002	17	abcdefgh
19	J3009	17	abcdefghi
20	Sapelo	17	abcdefghi
21	Sofire	17	abcdefghi
22	Sweet Emotion	17	abcdefghi
23	Sweet Magnolia	17	abcdefghi
24	Candy Ann	13	abcdefghi
25	Emy55455	13	abcdefghi
26	Macon	13	abcdefghi
27	Pirate	13	abcdefghi
28	Red Duke	13	abcdefghi
29	Sweet Harvest	13	abcdefghi
30	Allison	8	abcdefghi
31	Granex Yellow PRR	8	abcdefghi
32	NT-AC0901	8	abcdefghi
33	Red Sensation	8	bcdefghi
34	Sweet Azalea	8	bcdefghi
35	Century	4	cdefghi
36	EMY 55126	4	cdefghi
37	Emy55457	4	defghi
38	GA Boy	4	defghi
39	Plethora	4	efghi
40	Sabrina	4	fghi
41	Tania (J3013)	4	ghi
42	Bejo J3014	0	ghi
43	Lucille	0	hi
44	SON-109Y	0	i
45	Sweet Jasper	0	i

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

Rank	Variety	Culls yield	
1	Sweet Magnolia	580	a
2	Sweet Jasper	517	ab
3	Century	495	ab
4	Sweet Azalea	445	abc
5	Mata Hari	445	abc
6	Sweet Harvest	424	abcd
7	Sweet Emotion	424	abcde
8	WI-129	390	abcde
9	Allison	364	abcde
10	Macon	330	abcde
11	Vulkana	326	abcdef
12	Granex Yellow PRR	322	abcdef
13	Candy Ann	305	abcdef
14	Red Duke	284	abcdef
15	SON-109Y	284	abcdefg
16	Red Hunter	280	abcdefg
17	Sweet Agent	271	abcdefgh
18	Emy55455	267	abcdefgh
19	Hazera 3662	263	abcdefghi
20	Emy55457	241	abcdefghi
21	Superex	237	abcdefghi
22	Plethora	237	abcdefghi
23	GA Boy	233	abcdefghi
24	EMY 55126	233	abcdefghi
25	Sapelo	224	abcdefghi
26	NT-AC0901	212	abcdefghi
27	Candy Kim	203	abcdefghi
28	1407	195	abcdefghi
29	J3009	186	abcdefghi
30	New Frontier	186	abcdefghi
31	Sabrina	182	abcdefghi
32	Pirate	152	abcdefghi
33	Quick Start	144	bcdefghi
34	Bejo J3014	136	bcdefghi
35	Dulciana	131	cdefghi
36	Candy Joy	127	cdefghi
37	Vidora	119	defghi
38	Fast Track	114	defghi
39	Sofire	110	efghi
40	Lucille	110	fghi
41	2002	68	ghi
42	Tania (J3013)	64	ghi
43	Rio Dulce	55	hi
44	Althea	51	i
45	Red Sensation	42	i



Table 7. Vidalia onion seed stem count measured on April 3, 2020.

Rank	Variety	Seedstem count / 25 sq. ft. plot	
1	EMY 55126	108	a
2	Red Sensation	101	ab
3	Sabrina	83	ab
4	GA Boy	77	abc
5	Vulkana	70	abc
6	Tania (J3013)	67	abcd
7	Vidora	64	abcde
8	Bejo J3014	57	abcde
9	J3009	57	abcde
10	Lucille	57	abcde
11	Emy55457	45	abcdef
12	Plethora	43	abcdef
13	NT-AC0901	37	abcdef
14	Sapelo	29	abcdef
15	Granex Yellow PRR	27	abcdefg
16	Pirate	27	abcdefg
17	Sweet Azalea	27	abcdefgh
18	2002	20	abcdefgh
19	Red Hunter	19	abcdefghi
20	Hazera 3662	17	abcdefghi
21	SON-109Y	17	abcdefghi
22	Dulciana	16	abcdefghi
23	Emy55455	16	abcdefghi
24	Sweet Jasper	15	abcdefghi
25	Red Duke	13	abcdefghi
26	Althea	13	abcdefghi
27	Rio Dulce	13	abcdefghi
28	Candy Joy	12	abcdefghi
29	WI-129	10	abcdefghi
30	1407	10	abcdefghi
31	Superex	9	abcdefghi
32	Quick Start	7	abcdefghi
33	Sweet Agent	7	bcdefghi
34	Sweet Magnolia	6	bcdefghi
35	Candy Kim	6	cdefghi
36	Macon	6	cdefghi
37	Candy Ann	4	defghi
38	Mata Hari	4	defghi
39	Century	4	efghi
40	Fast Track	4	fghi
41	Sweet Harvest	4	ghi
42	Allison	2	ghi
43	New Frontier	2	hi
44	Sweet Emotion	1	i
45	Sofire	0	i

## ***UGA Variety Trial Quality Report 2019 – 2020 Crop Season***

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### **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, and methyl thiosulfinate content. 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 2019-2020 growing season, as well as compares the performance of each variety over the past three growing seasons.

### **Materials and methods**

Forty two onion varieties were analyzed as part of the 2019 – 2020 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.* 2017<sup>1</sup>.

### **Results and Discussion**

The following tables compare the concentrations of flavor-associated compounds in onions grown as a part of the 2019-2020 variety trial. Additionally, the cumulative variety flavor quality rankings are provided for the past three growing 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**

<sup>1</sup>Kim 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. Pyruvic acid content in onions submitted to the UGA Agricultural & Environmental Services Labs as a part of the 2019-2020 variety trial.

Variety	Pyruvic Acid (μmole/g)	
Sapelo	6.1	a
Tania (J3013)	5.9	ab
Althea	5.8	ab
Quick Start	5.7	ab
1407	5.7	abc
3662	5.6	abc
Sabrina - EWR 1019	5.6	abc
Mata Hari	5.6	abc
Fast Track	5.6	abc
Candy Joy	5.5	abc
J3014	5.5	abc
Vulkana	5.4	abc
2002	5.3	abc
Candy Kim	5.3	abc
Sweet Emotion	5.3	abc
Rio Dulce	5.2	abc
Pirate	5.2	abcd
New Frontier	5.1	abcd
Superex	5.1	abcd
GA Boy	5.1	abcd
Sofire	5.1	abcd
Sweet Harvest	5.1	abcd
Sweet Agent	5.1	abcd
Dulciana	5.1	abcd
J3009	5.1	abcd
Emy55455	4.9	abcd
Red Sensation	4.9	abcd
Lucille	4.9	abcd
Alison	4.8	abcd
Candy Ann	4.7	abcd
WI-129	4.7	abcd
SON 109Y	4.6	abcd
Red Duke	4.5	abcd
Vidora	4.4	abcd
Macon	4.2	abcd
Granex Yellow PRR	4.2	abcd
Red Hunter	4.0	abcd
Sweet Magnolia	4.0	abcd
Century	3.9	bcd
Plethora	3.8	bcd
Sweet Azalea	3.5	cd
NT-AC0901	3.1	d

\*Similar letters between varieties indicate those varieties are not significantly different according to Tukey test ( $P \leq 0.05$ ). Data for EMY 55126 (5.3 μmole/g), Sweet Jasper (4.2 μmole/g), and EMY 55457 (3.3 μmole/g) were excluded as only two replicates were received.

Table 2. Onion lachrymatory factor (propanethial S-oxide) content in onions submitted to the UGA Agricultural & Environmental Services Labs as a part of the 2019-2020 variety trial.

Variety	Lachrymatory Factor ( $\mu\text{mole/g}$ )	
Sapelo	5.4	a
Quick Start	5.3	ab
Sofire	4.8	abc
Tania (J3013)	4.4	abcd
Fast Track	4.2	abcde
Pirate	4.2	abcde
3662	4.2	abcde
Sabrina - EWR 1019	3.9	abcdef
Vidora	3.8	abcdef
Sweet Harvest	3.7	abcdefg
Candy Joy	3.6	abcdefg
Red Sensation	3.6	abcdefg
1407	3.5	abcdefg
Vulkana	3.5	abcdefg
Granex Yellow PRR	3.4	abcdefg
Rio Dulce	3.4	abcdefg
New Frontier	3.4	abcdefgh
J3009	3.4	abcdefg
Sweet Emotion	3.4	abcdefgh
2002	3.3	abcdefgh
WI-129	3.3	abcdefg
Althea	3.3	abcdefgh
Candy Ann	3.3	abcdefgh
Candy Kim	3.3	abcdefgh
Emy55455	3.2	abcdefgh
Mata Hari	3.0	bcdefgh
Lucille	3.0	bcdefgh
Red Duke	2.8	cdefgh
SON 109Y	2.8	cdefgh
Alison	2.8	cdefgh
Dulciana	2.7	cdefgh
Superex	2.6	cdefgh
J3014	2.5	cdefgh
GA Boy	2.5	cdefgh
Macon	2.4	cdefgh
Sweet Azalea	2.1	defgh
Century	2.0	defgh
Sweet Agent	1.9	efgh
Sweet Magnolia	1.7	fgh
Plethora	1.6	fgh
Red Hunter	1.3	gh
NT-AC0901	1.0	h

\*Similar letters between varieties indicate those varieties are not significantly different according to Tukey test ( $P \leq 0.05$ ). Data for EMY 55126 ( $2.2 \mu\text{mole/g}$ ), Sweet Jasper ( $2.0 \mu\text{mole/g}$ ), and EMY 55457 ( $1.7 \mu\text{mole/g}$ ) were excluded as only two replicates were received.

Table 3. Methyl thiosulfinate content in onions submitted to the UGA Agricultural & Environmental Services Labs as a part of the 2019-2020 variety trial.

Variety	Methyl Thiosulfinates (nmole/g)	
Sweet Agent	0.033	a
1407	0.032	a
Candy Joy	0.031	ab
WI-129	0.030	ab
Quick Start	0.030	abc
Candy Kim	0.030	abc
Candy Ann	0.029	abc
Fast Track	0.029	abc
Sweet Emotion	0.028	abcd
New Frontier	0.028	abcd
Sapelo	0.027	abcde
Lucille	0.027	abcdef
Mata Hari	0.025	abcdef
Sofire	0.023	abcdef
Macon	0.023	abcdefg
Red Hunter	0.021	abcdefg
GA Boy	0.020	abcdefg
Granex Yellow PRR	0.020	abcdefg
Superex	0.020	abcdefg
Emy55455	0.020	abcdefg
Alison	0.020	abcdefg
Pirate	0.020	abcdefg
Sabrina - EWR 1019	0.019	abcdefg
SON 109Y	0.019	abcdefg
Vidora	0.019	abcdefg
Sweet Harvest	0.019	abcdefg
2002	0.018	abcdefg
Rio Dulce	0.018	abcdefg
Althea	0.016	abcdefg
Red Sensation	0.016	abcdefg
Red Duke	0.016	abcdefg
3662	0.014	abcdefg
Sweet Azalea	0.014	abcdefg
J3009	0.012	cdefg
Vulkana	0.011	cdefg
Tania (J3013)	0.010	cdefg
Dulciana	0.009	defg
Sweet Magnolia	0.008	efg
Plethora	0.007	efg
J3014	0.006	fg
Century	0.006	fg
NT-AC0901	0.004	g

\*Similar letters between varieties indicate those varieties are not significantly different according to Tukey test ( $P \leq 0.05$ ). Data for EMY 55126 (0.021  $\mu\text{mole/g}$ ), Sweet Jasper (0.012  $\mu\text{mole/g}$ ), and EMY 55457 (0.008  $\mu\text{mole/g}$ ) were excluded as only two replicates were received.



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

<b>Variety</b>	<b>Rank</b>
NT-AC0901	1
Emy 55457	2
Plethora	3
Century	4(t)
Sweet Magnolia	4(t)
Sweet Azalea	6
Red Hunter	7
J3014	8(t)
Sweet Jasper	8(t)
Dulciana	8(t)
Red Duke	11(t)
Macon	11(t)
J3009	12(t)
XON 109Y	12(t)
Vulkana	15
Alison	16(t)
GA Boy	16(t)
Granex Yellow PRR	16(t)
Superex	16(t)
Emy 55126	20(t)
Vidora	20(t)
Emy55455	22(t)
Red Sensation	22(t)
Sweet Harvest	22(t)
2002	25(t)
Rio Dulce	25(t)
Lucille	25(t)
Pirate	28(t)
Sweet Agent	28(t)
3662	30(t)
Candy Ann	30(t)
Althea	32(t)
Mata Hari	32(t)
Candy Kim	34(t)
Sabrina - EWR 1019	34(t)
New Frontier	34(t)
Tania (J3013)	34(t)
WI-129	34(t)
Sweet Emotion	39
Sofire	40
Candy Joy	41
1407	42(t)
Fast Track	42(t)
Quick Start	44
Sapelo	45

Table 5. Overall flavor quality ranking of yellow variety trial onions grown in three consecutive years (2018-2020) ranked in order of lowest overall Pyruvic acid, Lachrymatory factor, and Methyl Thiosulfinates results. Only those varieties with data from all three growing seasons were included in the table.

<b>Variety</b>	<b>Rank</b>
Plethora	1
Sweet Magnolia	2
Sweet Azalea	3
Century	4(t)
Sweet Agent	4(t)
Sweet Jasper	6
XON 109Y	7
Vidora	8(t)
Alison	8(t)
Sweet Harvest	8(t)
J3009	11
New Frontier	12
Pirate	13
Granex Yellow PRR	14
Candy Joy	15(t)
1407	15(t)
Candy Kim	15(t)
Tania (J3013)	15(t)
Macon	19
WI-129	20(t)
Sweet Emotion	20(t)
Candy Ann	22
EMY 55455	23(t)
Fast Track	23(t)
Quick Start	25
Sapelo	26