Vegetable and Fruit

Variety Trials
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Tips to Interpret Results on Vegetable Variety Performance

Edgar Vinson and Joe Kemble

Introduction: The information provided by this report must be studied carefully in order to make the best selections possible. Although yield is a good indicator of varietal performance, other information must be studied. The following provides a few tips to adequately interpret results in this report.

Open-Pollinated or Hybrid Varieties

In general, hybrids (also referred to as F1) are earlier and produce a more uniform crop. They have improved disease, pest or virus tolerance/resistance. F1 varieties are often more expensive than open pollinated varieties (OP), and seeds cannot be collected from one crop to plant the next. Despite the advantages hybrids offer, OP are often still planted in Alabama. Selecting a hybrid variety is the first step toward earliness and quality.

Yield Potential

Yields reported in variety trial results are extrapolated from small plots. Depending on the vegetable crop, plot sizes range between 100 to 500 square feet. Yields per acre are estimated by multiplying plot yields by corrective factors ranging from 100 to 1,000. Small errors are thus amplified and estimated yields per acre may not be realistic. Therefore, locations cannot be compared simply by looking at the range of yields reported. However, the relative differences in performance among varieties are realistic and can be used to identify best-performing varieties.

Statistical Interpretation

The coefficient of determination (R2), coefficient of variation (CV) and least significant difference (LSD, 5%) are reported for each test. These numbers are helpful in separating the differences due to small plots (sampling error) and true (but unknown) differences among entries.

R2 ranges between 0 and 1. Values close to 1 suggest that the test was conducted under good conditions and most of the variability observed was mainly due to the effect of variety and replication. Random, uncontrolled errors were of lesser importance. CV is an expression of yield variability relative to yield mean. Low CVs are desirable (under 20%) but are not always achieved.

There must be a minimum yield difference between two varieties before one can statistically conclude that one variety actually performs better than another.

This is known as the least significant difference (LSD). When the difference in yield is less than the lsd value, one cannot conclude that there is any real difference between two varieties. For example, in the pumpkin trial presented in this issue conducted at the E.V. Smith Research Center in Shorter, AL, 'Mustang' yielded 20,837 pounds per acre, while 'Camero' and 'Phatso Jr.' yielded 15,777 and 12,258 pounds per acre, respectively. Since there was less than a 7,168 difference between 'Mustang' and 'Camero,' there is no statistical difference between these two varieties. However, the yield difference between 'Mustang' and 'Phatso Jr' was 8,579 pounds per acre, indicating that there is a real difference between these two varieties. From a practical point of view, producers should place the most importance on LSD values when interpreting results.

Testing Condition

AU vegetable variety trials are conducted under standard, recommended commercial production practices. If the cropping system to be used is different from that used in the trials, the results of the trials may not apply. Information on soil type (Table 2), planting dates, fertilizer rates and detailed spray schedule are provided to help producers compare their own practices to the standard one used in the trials and make relevant adjustments.

Ratings of Trials

At each location, variety trials were rated on a 1 to 5 scale, based on weather conditions, fertilization, irrigation, pest pressure and overall performance (Table 3). Results from trials with ratings of 2 and under are not reported. These numbers may be used to interpret differences in performance from location to location. The overall rating may be used to give more importance to the results of variety performance under good growing conditions.

Where to Get Seeds

Because seeds are alive, their performance and germination rate depends on how old they are, where and how they were collected, and how they have been handled and stored. It is always preferable to get certified seeds from a reputable source, such as the ones listed in the Appendix. Several factors other than yield have to be considered when choosing a vegetable variety from a variety trial report. The main factors are type, resistance and tolerance to diseases, earliness and of course, availability and cost of seeds. It is always better to try two to three varieties on a small scale before making a large planting of a single variety.

Vegetable and Fruit Variety Trials on the Web – to view this and other publications online go to:
www.aaes.auburn.edu/comm/pubs/pubs-by-type/rebulllist.php

Table 1

Description of Ratings

Rating	Weather	Fertilizer	Irrigation	Pests	Overall
5	Very Good	Very Good	Very Good	None	Excellent
4	Favorable	Good	Good	Light	Good
3	Acceptable	Acceptable	Acceptable	Tolerable	Acceptable
2	Adverse	Low	Low	Adverse	Questionable
1	Destructive	Very Low	Insufficient	Destructive	Useless

Table 2

Soil Types at the Location of the Trial

Location	Water holding capacity (In.)	Soil type
Gulf Coast Research and Extension Center (Fairhope)	0.09-0.19	Malbis fine sandy loam
Brewton Experiment Field (Brewton)	0.12-0.14	Benndale fine sandy loam
Wiregrass Research and Extension Center (Headland)	0.14-0.15	Dothan sandy loam
Lower Coastal Plain Research and Extension (Camden)	0.13-0.15	Forkland fine sandy loam
EV Smith Research Center, Horticultural Unit (Shorter)	0.15-0.17	Norfolk-orangeburg loamy sand
Chilton Area Horticultural Substation (Clanton)	0.13-0.15	Luvernue sandy loam
Upper Coastal Plain Research and Extension Center (Winfield)	0.13-0.20	Savannah loam
North Alabama Horticultural Substation (Cullman)	0.16-0.20	Hartsells-Albertville fine sandy loam
Sand Mountain Research and Extension Center (Crossville)	0.16-0.18	Wynnville fine sandy loam

Peach Rootstock Cultivar Evaluation

Elina Coneva, Edgar Vinson and Jim Pitts

Studies continue to evaluate the influence of 14 newly developed or imported peach rootstocks on peach tree survivability, disease resistance, crop load, fruit quality and vegetative growth. The experimental block located at the Chilton Research and Extension Center (CREC) near Clanton was planted in 2009. The following peach rootstocks are being investigated: 'Guardian' and 'Lovell' (serve as standards); 'Viking', 'Atlas', 'BH-5' (Bacterial canker resistant); 'Krymsk@86' (wet feet tolerant); 'KV010123', 'KV010127' (USDA breeding program); 'Empyrean 2', 'HBOK 10', 'HBOK 32', 'Krymsk®1VVA-1', and 'Controller 5' (size controlling rootstocks). 'Redhaven' was used as a scion cultivar. Experimental design is a completely randomized block with eight single-tree replications. Data on peach tree vegetative growth including trunk circumference, tree height and width, number of suckers per trunk, and tree survivability were collected for a fourth consecutive season.

Trees on 'Guardian' and 'Krymsk®86' were the most vigorously growing in 2012, based on their trunk cross sectional area (Table 3.1). For the fourth consecutive season, 'HBOK 10' and 'HBOK 32' demonstrated the least tree vigor of 30.8 and 33.9 centimeters2 TCSA, respectively. 'Krymsk®1VVA-1' also had a weak trunk growth of 37.7 cm2.

Trees on 'Emparyan ®2' flowered about two days earlier than trees grafted on other rootstocks in the trial differed, based on our records of the Julian date of 90% open flowers (Table 3.1). Julian day of 10 percent ripe fruit varied between 156.9 for 'Viking' to 160.5 for 'Mirobac' (Table 3.1).

The greatest total yield of 41.2 kilograms per tree was recorded for trees grafted on 'Guardian' rootstock (Table 3.1). Trees on 'Atlas', 'BH-5', 'Lovell', and 'Krymsk ®86' produced over 30.0 kg per tree, while 'Krymsk®1VVA-1' produced the lowest yield of 4.9 kilograms. 'Guardian,' 'Viking,' 'Mirobac' and 'KV010-123' had high number of fruit sized less than 2.25 inches. Mean fruit weight varied between 177.1 grams for trees on 'BH-'5 and 152.3 grams for 'Krymsk®86.' No differences were found among the fruit produced from the 14 tested rootstocks in terms of soluble solids content (Brix percent) and fruit firmness (Table 3.1).

In addition to the four previously dead trees - one grafted on 'HBOK 32,' two trees grafted on 'Krymsk@1VVA-1' and one on 'Emparyan@2,' we lost one more 'Emperian@2,' three trees grafted on 'Krymsk@1VVA-1' and seven trees grafted on 'Mirobac' (Table 3.2). It was established that the peach tree short

life (PTSL) was responsible for the death of 'Mirobac' grafted trees. Once again trees on 'Guardian' were found to have the highest number of suckers (3.6 on average) in their fourth growing season. 'BH-5' and 'Lovell' were also found to produce a few root suckers.

Based on tree height and width, trees grafted on 'Guardian,' 'Mirobac', 'BH-5,' 'Viking' and 'Atlas' were found to be vigorously growing, while 'Krymsk@1V-VA-1' had the least canopy growth in 2012 (Table 3.2).

Table 3.1

Field Performance of 'Redhaven' Peach on 14NC-140 Rootstocks, near Clanton, AL, 2012

Rootstock Cultivar	TCSA cm^2	Julian Day of 90% Open Flowers	Julian Day of 10% Ripe Fruit	Total Yield kg	Total No. Fruit <2.25"	Mean Fruit Weight g	Brix %	Firmness
CONTROLLER 5 (K146-46	39.7 cd	77.1 a	159.5 abcd	18.9 e	10.6 bcde	156.9 def	10.9	1.7
MIROBAC	80.7 ab	77.3 a	160.5 a	20.8 cde	20.5 a	173.0 ab	11.2	2.8
HBOK 10	30.8 d	77.4 a	159.3 abcde	18.2 e	9.1 cde	156.7 def	11.3	2.0
BH-5	79.8 ab	77.1 a	157.0 fg	36.5 ab	.1 a	177.1 a	10.6	2.0
GUARDIAN	93.6 a	77.1 a	158.4 defg	41.2 a	23.0 a	158.5 cde	10.7	1.9
LOVELL	68.9 abc	77.0 a	159.3 abcde	31.1 abc	17.1 abc	153.9 ef	10.9	1.5
HBOK 32	33.9 d	77.0 a	160.1 abc	19.3 e	8.1 de	162.7 bcdef	10.1	2.0
KRYMSK® 1 VVA-1	37.7 d	77.0 a	160.3 ab	4.9 f	2.2 e	168.0 abcd	11.2	1.8
EMPYREAN® 2 (PENTA)	59.8 bcd	74.8 b	157.8 efg	20.4 de	8.5 cde	165.2 abcdef	10.6	1.6
VIKING	77.4 ab	77.1 a	156.9 g	27.1 bcde	15.4 abcd	165.5 abcde	11.0	1.5
ATLAS	69.9 abc	77.1 a	158.6 cde	34.8 ab	20.0 a	171.5 abc	10.7	2.1
KRYMSK® 86 (KUBAN 86)	92.9 a	76.9 a	158.5 def	30.5 bcd	16.0 abcd	152.3 f	10.8	1.6
KV010-123	52.6 bcd	76.9 a	158.4 defg	26.4 bcde		153.5 ef	10.7	1.7
KV010-127	58.2 bcd	76.9 a	158.8 bcde	22.7 cde		156.0 def	10.9	1.3
Significance	***	***	***	***	***	***	n.s.	n.s.
P-Value	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.2363	0.4676

Table 3.2

Field Performance of 'Redhaven' Peach on 14NC-140 Rootstocks, near Clanton, AL, 2012

Rootstock Cultivar	Survival	No. Root Suckers	Width 1 cm	Width 2 cm	Height cm
CONTROLLER 5 (K146-46	1.0 a	0.0 b	395.5 c	401.9 def	253.0 bcde
MIROBAC	0.3 c	0.0 b	512.1 ab	531.9 a	298.8 ab
HBOK 10	1.0 a	0.0 b	391.3 cd	361.1 f	240.8 cde
BH-5	1.0 a	0.0 b	557.8 a	538.3 a	313.2 a
GUARDIAN	1.0 a	3.6 a	517.0 ab	529.9 a	292.2 ab
LOVELL	1.0 a	0.4 b	516.7 ab	525.0 a	279.3 abcd
HBOK 32	0.8 ab	0.0 b	406.2 c	392.3 ef	236.2 de
KRYMSK® 1 VVA-1	0.5 bc	0.0 b	323.9 d	371.9 f	211.9 e
EMPYREAN® 2 (PENTA)	0.6 b	0.0 b	490.1 ab	456.6 bc	270.0 abcd
VIKING	1.0 a	0.1 b	517.8 ab	507.9 ab	316.1 a
ATLAS	1.0 a	0.0 b	548.3 a	510.5 ab	285.4 abc
KRYMSK® 86 (KUBAN 86)	1.0 a	0.6 b	459.9 bc	449.9 cd	270.1 abcd
KV010-123	1.0 a	0.1 b	495.3 ab	462.2 bc	278.5 abcd
KV010-127	1.0 a	0.6 b	457.2 bc	446.2 cde	278.1 abcd
Significance	***	**	***	***	**
P-Value	<.0001	<.0049	<.0001	<.0001	0.0018

Hybrid Bunch Grape Cultivar Evaluation Trial in Alabama

Elina Coneva, Edgar Vinson and Joyce Ducar

An experimental vineyard was established at the Sand Mountain Research and Extension Center (SMREC) in Crossville, Alabama in 2008 to compare the performance and determine the best suited Pierce's Disease (PD) tolerant American and French-American hybrid bunch grape cultivars for commercial production in Alabama conditions. Ten cultivars were included in our test: 'Black Spanish,' 'Blanc du Bois,' 'Champanel,' 'Conquistador,' 'Cynthiana,' 'Favorite,' 'Lake Emerald,' 'Seyval Blanc,', 'Seyval Blanc' grafted on C3309, 'Stover' and 'Villard Blanc.' The vineyard experimental design is a RCBD with four replications and four vines per plot. To assess cultivar vigor and development, measurements are collected on vine pruning weight, trunk cross sectional area, leaf area and chlorophyll rates. Cultivar phenology is studied by recording the early-shoot development, percent open flowers, and veraison progression throughout the growing season. Cultivar productivity and fruit quality are determined based on total yield per vine, mean cluster and berry weight, and soluble solids content.

Our 2011-2012 results indicate that based on pruning weight, 'Champanel' had the most vigorous vegetative growth while 'Seyval Blanc' had the weakest (Figure 1.1). 'Stover' had the earliest shoot development while 'Champanel' and 'Cynthiana' developed late in the season. 'Stover' and 'Seyval Blanc' flowered early while 'Cynthiana' and 'Lake Emerald' bloomed late. 'Seyval Blanc' and 'Seyval Blanc'/3309C had an early fruit maturity while 'Lake Emerald' matured late (data not shown). 'Villard Blanc' produced the largest yield of 12.7 kg/vine (Figure 1.2) and had the largest cluster weight of 287.1 g (Figure 1.3). 'Champanel' produced the largest berries of 4.8 grams (Table 4.1). 'Cynthiana' and 'Lake Emerald' had the highest soluble solids content with 19.8 percent and 18.8 percent, respectively, while 'Champanel' had a SSC of 13.1 percent at harvest (data not shown). 'Blanc du Bois' and 'Stover' had the highest pH of 3.58 and 3.49, respectively. There were no significant differences in titratable acidity among cultivars tested which ranged from 0.56 to 1.36 grams per 100 milliliters (data not shown). Based on our two-year observations, 'Cynthiana' (Figure 1.4A), 'Villard Blanc' (Figure 1.4B) and 'Black Spanish' were the best performing cultivars combining vigorous vegetative growth, high yields, and good fruit quality at the SMREC during the two years of studies. Research will continue and multiple season data is going to provide more complete evaluation on suitability of growing hybrid bunch grape cultivars in Alabama and the Southeast.

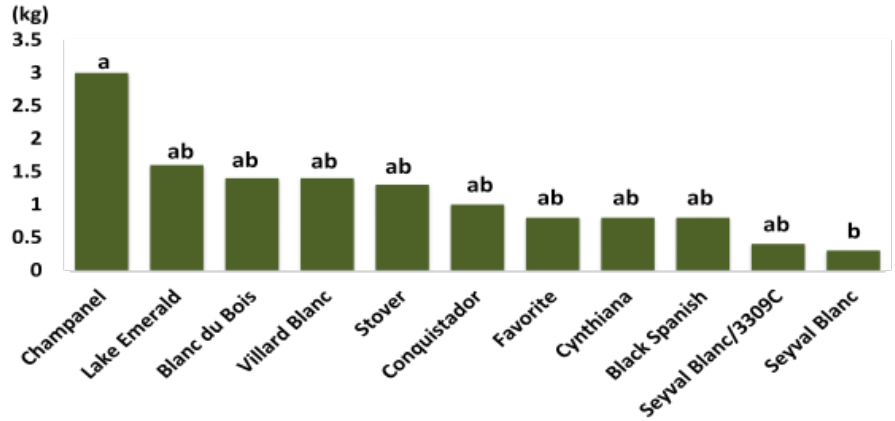

Figure 1.1. Pruning weight of hybrid bunch grape cultivars grown at the SMREC, 2011-2012.

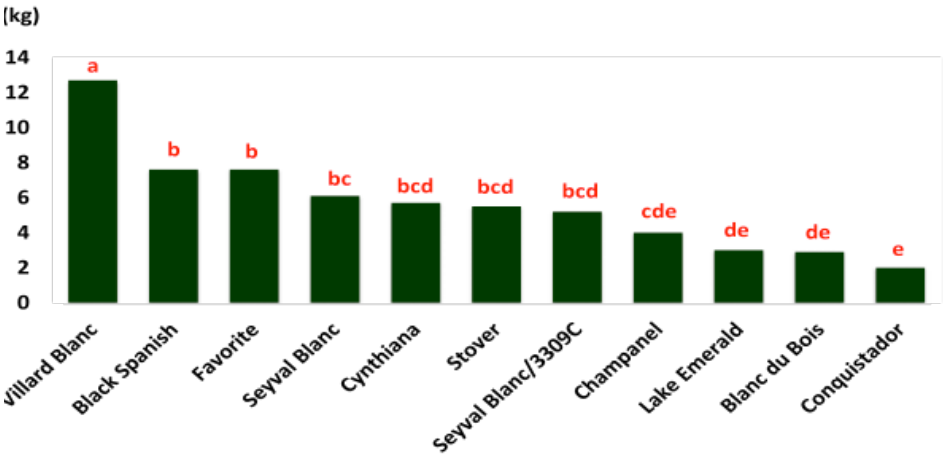

Figure 1.2. Yield of hybrid bunch grape cultivars grown at the SMREC, 2011-2012.

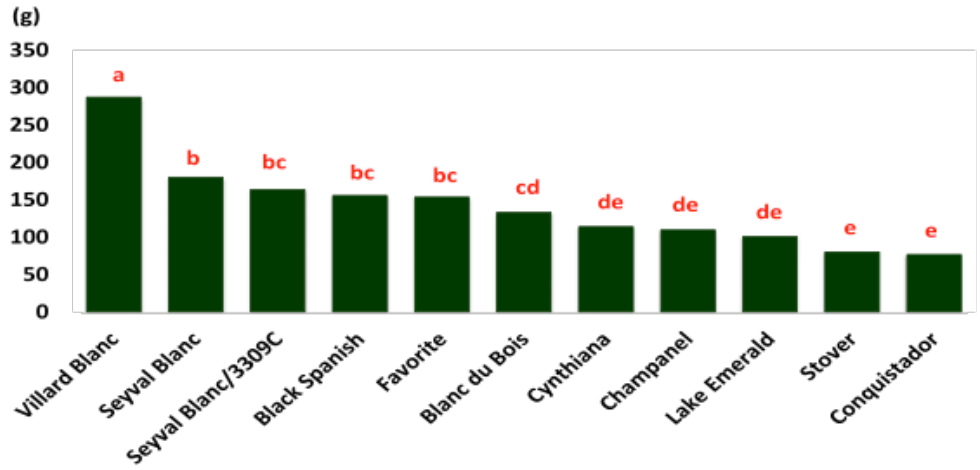

Figure 1.3. Cluster weight of hybrid bunch grape cultivars grown at the SMREC, 2011-2012.

Table 4.1
Mean Berry Weight of Hybrid Bunch Cultivars, SMREC, 2011-2012

Cultivar	Mean Berry Weight (g)
Champanel	4.8 a
Blanc du Bois	3.6 b
Villard Blanc	3.1 c
Stover	2.5 d
Seyval Blanc/3309C	2.0 e
Seyval Blanc	1.9 ef
Black Spanish	1.8 fg
Favorite	1.7 g
Lake Emerald	1.6 g
Cynthiana	1.5 g
Conquistador	1.5 g

A  B 

Figure 1.4 (A,B). 'Cynthiana' produced vigorous and productive vines with an excellent fruit quality (A); 'Villard Blanc' had an excellent vigor and productivity with a good fruit quality (B).

Seedless Table Grapes and Advanced Selections from the University of Arkansas

Elina Coneva, Edgar Vinson and Arnold Caylor

The University of Arkansas breeding program began in 1964 with a focus on the development of table grape cultivars with major characteristics such as seedlessness, crisp texture, and edible skin. Released from the program were the seedless table grape cultivars 'Venus' (1977), 'Reliance' (1983), 'Mars' (1985), 'Saturn' (1989), 'Jupiter' (1999), 'Neptune' (1999). In 2012, four new seedless table grape selections were released including 'Faith,' 'Hope,' 'Joy' and 'Gratitude' cultivars. Four released seedless table grape cultivars and eight advanced selections developed by the breeding program, and two hybrid bunch grape cultivars included as controls were planted at the North Alabama Horticulture Research Center (NAHRC), Cullman, AL in 2008 to evaluate the best suited table and processing grape selections in Alabama environment.

'Neptune'

'Joy'

'Gratitude'

Vegetative growth, cropping potential and fruit quality of the tested cultivars and selections were evaluated during 2011 and 2012 seasons. Our results indicate that 'Joy' (selection 'A 2494') had the most vigorous vegetative growth based on pruning weigh per vine, while 'A 2786' had the least growth (Figure 2.1). 'Stover' had the earliest shoot (Figure 2.2) and flower bud development in both seasons. Selection 'A 2359' had 3.5 fruiting clusters per shoot that was the highest fruiting cluster number among all the cultivars and selections (data not shown). 'Mars' and 'Faith' (selection 'A 2412') were early ripening and early maturing, while 'Conquistador' started to develop late in the season. The highest yielding selections and cultivars recorded were 'A 2574', 'A 2359,' 'Neptune,' 'A 2245' and 'Conquistador' that produced 12.0 kilograms per vine or higher in both experimental years (Table 5.1). Seedless table grape cultivars 'Gratitude' and 'Neptune' had the largest cluster size of 490 grams. 'Gratitude' (selection 'A 2505') and 'A 2817' produced the largest berries of 4.9 grams.

'A 2632' had the highest soluble solids content, while 'Conquistador' had the lowest sugar concentration at harvest (Table 5.2). Fruit pH level of all cultivars and selections ranged from 3.28 to 3.95. 'A 2817' had the highest number of seed traces, 3.2, while 'Gratitude' had the lowest number of seed traces (data not shown). Our preliminary results suggest 'Neptune' and 'Gratitude' were the best performing seedless table grape cultivars in North Alabama based on their vegetative growth, cropping potential, and fruit quality. 'Joy' and 'Faith' were the best suited black fruited seedless table grapes in our experimental vineyard. Studies will continue to assess the vines in multiple seasons and gather information on their disease resistance with a special focus on Pierce's disease resistance.

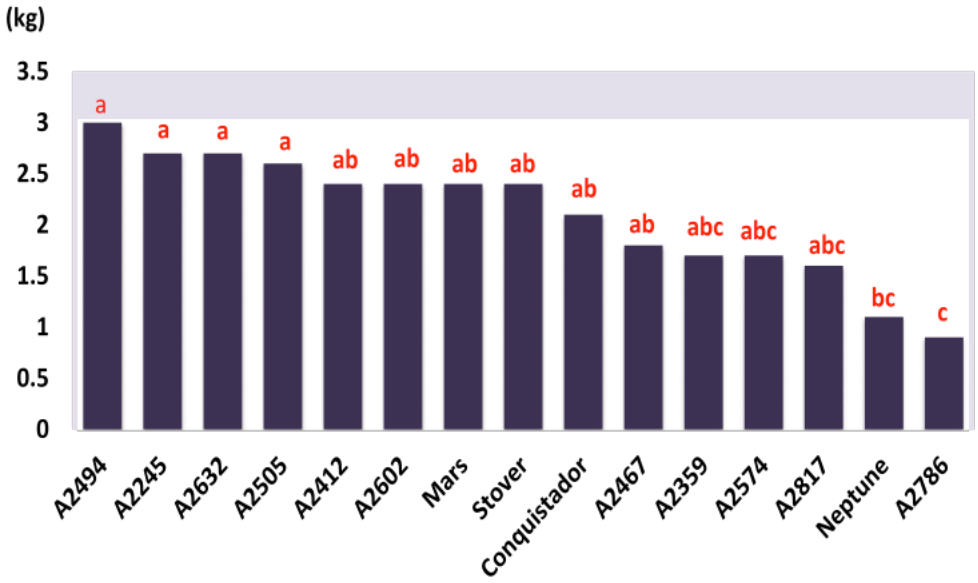

Figure 2.1. Pruning weight of selected seedless table grapes and advances selections grown at the NAHRC, Cullman, 2011-2012.

Table 5.1

Comparison Of Yield Per Vine, Cluster Weight and Berry Weight of Newly Released Grape Cultivars and Advanced Grape Selections Grown at The NAHRC, Cullman, AL, 2011 and 2012, combined[z]

Cultivar	Yield (kg/vine)	Cluster weight (g)	Berry weight (g)
A2574	13.7[y] a[x]	250.9 bc	1.8 ef
A2359	13.6 a	177.4 cd	2.3 de
Neptune	12.9 a	492.0 a	3.5 b
A2245	12.8 a	251.4 bc	2.4 cde
Conquistador	12.0 a	168.3 cd	2.9 bc
A2817	9.7 ab	360.9 b	4.9 a
A2467	9.1 ab	215.7 c	1.4 f
Mars	6.3 bc	235.1 c	3.3 b
Joy	6.2 bc	205.4 cd	2.5 cd
Faith	6.0 bc	217.1 c	3.2 b
Gratitude	5.3 bc	495.6 a	4.9 a
Stover	4.3 c	69.8 d	2.4 cd
A2602	2.7 c	157.2 cd	2.3 de
A2786	1.7 c	189.0 cd	3.6 b
A2632	1.5 c	74.5 d	2.1 de

[z] Means with no letters in common are statistically different. Year was analyzed as a random variable.
[y] All data presented are least squares means.
[x] Differences among cultivars were determined using the Simulate test at α = 0.05.

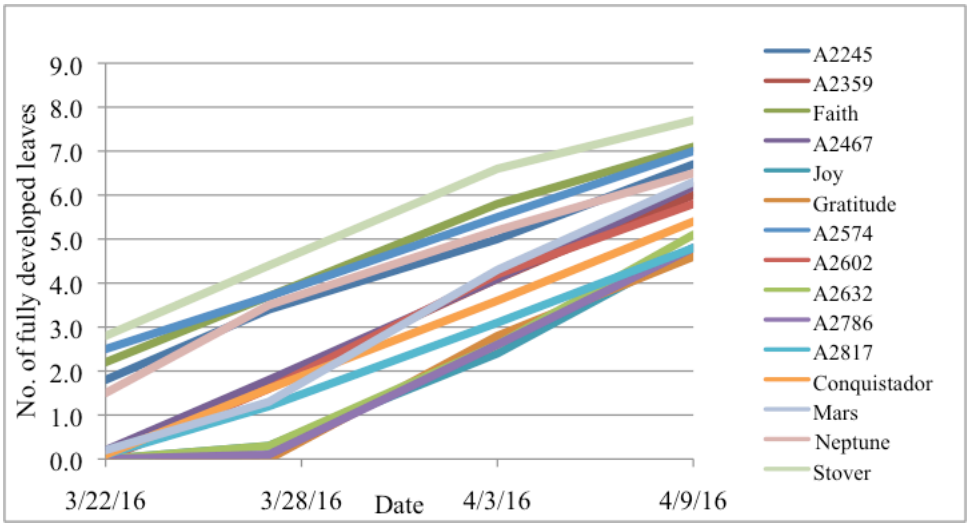

Figure 2.2. Comparison of early season shoot development of newly released grape cultivars and advanced grape selections grown at the NAHRC, Cullman, AL, in 2012.

Table 5.2

Comparison of Fruit pH, Soluble Solids Content (SSC) and Titratable Acidity (TA) of Newly Released Grape Cultivars and Advanced Grape Selections, NAHRC, Cullman, Al, in 2011 and 2012, combined[z]

Cultivar	pH	SSC (%)	TA (g/100 ml)
A2632	3.82	21.0[y] a[x]	0.78 b
Stover	3.81	18.1 ab	0.52 b
Faith	3.95	17.5 abc	0.62 b
Joy	3.54	16.7 abcd	0.70 b
A2574	3.56	16.7 bcd	0.66 b
A2602	3.83	15.8 cd	0.59 b
A2245	3.62	15.4 cd	0.66 b
A2359	3.55	15.2 cd	0.55 b
Gratitude	3.57	14.7 cde	0.70 b
Neptune	3.35	14.7 de	0.79 b
A2786	3.54	14.6 de	0.65 b
Mars	3.34	14.6 de	0.75 b
A2817	3.44	14.1 de	0.55 b
A2467	3.28	13.4 de	1.34 a
Conquistador	3.65	13.0 e	0.66 b

[z]Year was analyzed as a random variable.
[y]All data presented are least squares means.
[x]Means with no letters in common are statistically different. Differences among cultivars were determined using the Simulate test at α = 0.05

Preliminary Results of Growing Pierces Disease Resistant Vitis Vinifera Grapes Within the High Disease Pressure Southeastern Region

Elina Coneva, E. Vinson and J. Pitts

Current nutraceutical research revealed grapes are a powerful source of phytochemicals and antioxidants and very beneficial to human health. This breakthrough information triggered an increased market demand for fresh fruit and processed grape products. According to a March 2011 report provided by the U.S. Wine Institute, record high 2010 wine shipments make the U.S. the world's largest wine-consuming nation.

Although Pierce's Disease (PD) is a serious threat to the cultivation of grapes in the United States, especially in warmer southern regions, the U.C. Davis grape breeding program has recently developed new 87.5 percent V. vinifera PD resistant selections. These new accessions are expected to produce high quality yield even in regions with high PD pressure, such as the southeastern U.S., where the Vitis vinifera production was previously not a viable option. The objective of our study is to assess the feasibility of growing PD resistant V. vinifera selections in Alabama and the southeast.

An experimental vineyard was established at the Chilton Research and Extension Center (CREC), AL, in 2010 consisting of three recently developed PD resistant 87.5 percent V. vinifera selections, namely 502-10, 502-01, and 501-12. The grapevines were trained to a vertical shoot positioning (VSP) system and supplemental drip irrigation was provided to facilitate plant establishment. The grape selections grew well in 2011. Fruiting clusters were removed from the plants in an attempt to provide optimal conditions for the growth and development of the vine root system and enhance the vine vigor and longevity. In 2012 all three V. vinifera selections produced their first commercially significant crop. A number of measurements were collected to evaluate the vegetative growth, productivity, and fruit quality of these newly introduced grapevines.

To assess the pruning weight and aid in determining the optimal crop load, all of the dormant-pruned one-year-old wood was collected and weighed. Our results shown in Figure 3.1 suggest that selection 502-10 had the lowest pruning weight of 0.75 kilograms/vine, while 501-12 produced 1.1 kilograms pruning weight. The greater pruning weight indicates a more vigorously growing vine.

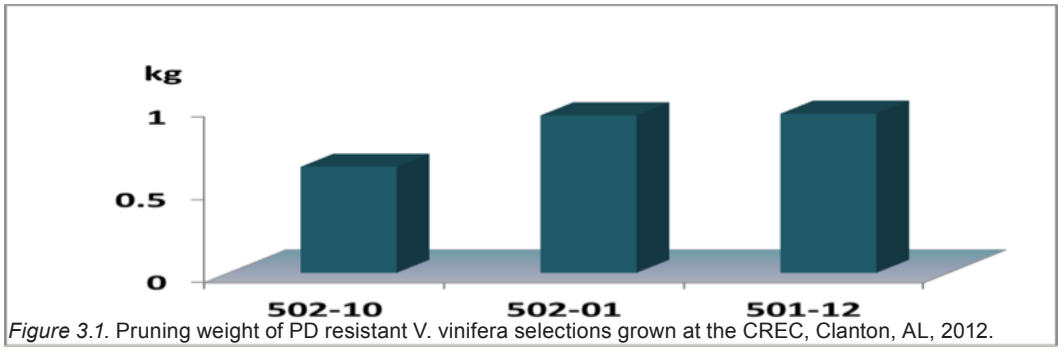

Figure 3.1. Pruning weight of PD resistant V. vinifera selections grown at the CREC, Clanton, AL, 2012.

During the 2012 season, selection 502-10 started the veraison (beginning of berry ripening) in early June and was harvested on July 11th, while 501-12 initiated the veraison in mid-August and matured late, on September 21st (Figure 3.2).

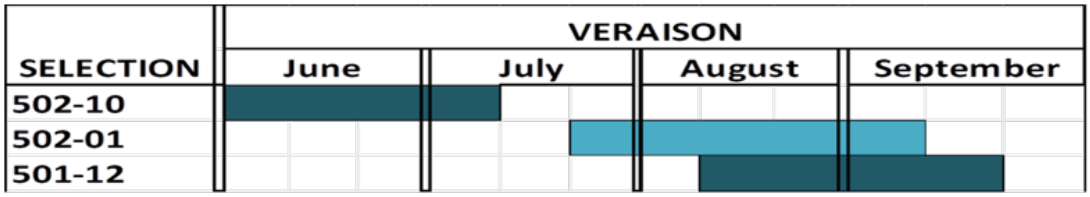

Figure 3.2. Veraison season of PD resistant V. vinifera selections grown at the CREC, Clanton, AL, 2012.

Our results showed statistical differences in total yield per vine during 2012 with the late maturing 501-12 producing the greatest crop of 5.8 kilograms/vine (Figure 3.3). Bird feeding was accountable for about 70 percent crop loss for the early ripening selection 502-10.

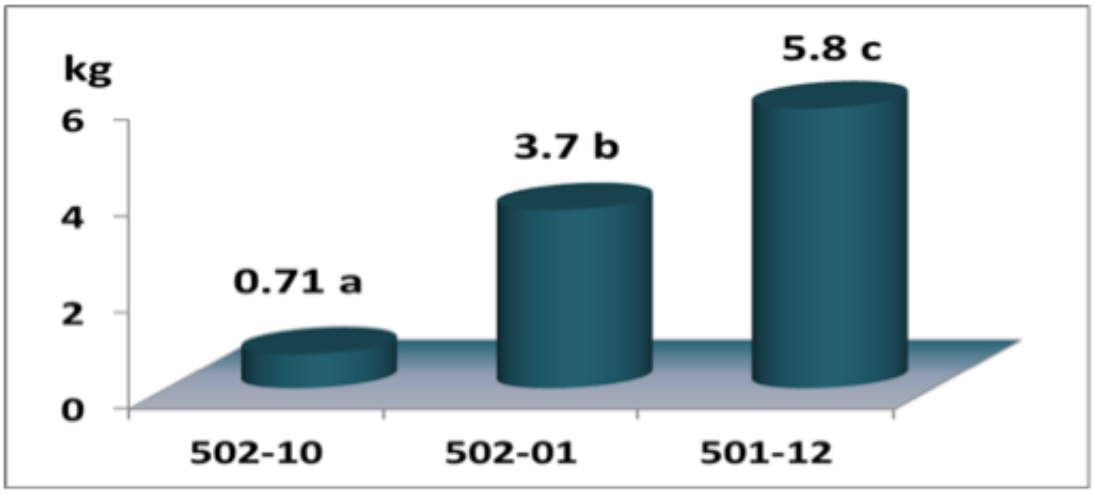

Figure 3.3. Total yield per vine of PD resistant V. vinifera selections grown at the CREC, Clanton, AL, 2012.

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During the 2012 season, selection 501-12 produced the highest number of clusters per vine (76.8), while the early ripening selection 502-10 had 12.5 clusters per vine (Table 1). Mid-season selection 502-01 had the greatest cluster weight of 173 g, and the mid-season selection 502-01 had the largest berries of 2.98 grams.

Table 12.1
Total Number of Clusters and Mean Cluster Size of PD Resistant V. Vinifera Selections Grown, CREC, 2012

Selection	Total Number of Clusters/Vine	Mean Cluster Weight (g)
502-10 (Early)	12.5 c	91 c
502-01 (Mid)	36.5 b	173 a
501-12 (Late)	76.8 a	134 b
Significance	***	***

In summary of our preliminary results:

A B C

Figure 3.4. A, B, C. Fruit clusters of PD resistant V. vinifera selections 502-10 (A), 502-01 (B), and 501-12 (C), 2012.

• Selection 502-10 (Figure 3.4 A) matured early in the season and sustained consid erable bird feeding damage. The 2012 pruning weight results suggest it is the least vigorously growing selection from this group.

• Mid-season selection 502-01 produced the largest clusters and the largest berry size in 2012 (Figure 3.4 B).

• PD resistant selection 501-12 matured late, had the greatest number of clusters, the highest yield and the highest fruit soluble solids content (Figure 3.4 C). This was the most vigorously growing grapevine selection based on our results of pruning weights.

The preliminary results on the performance of the newly developed PD resistant V. vinifera selections in Alabama are very encouraging. Knowledge gained through this project will aid in development of best management practices and production system recommendations, vital for the establishment of a sustainable grape industry, and enhance the competitiveness of Alabama-grown specialty crops. Our research will aid in introducing locally grown fresh and processed V. vinifera products, rich in antioxidants and resveratrol, proven to help in preventing cardiovascular diseases, inflammation and aging processes. The newly introduced selections are expected to improve the agricultural sustainability of Alabama and the Southeast.

Results of the 2012 National Sweetpotato Collaborators' Trial

Joe Kemble, Edgar Vinson and Arnold Caylor

National Sweetpotato Collaborators' trials were conducted at the North Alabama Horticulture Research Center (NAHRC) in Cullman, AL (Table 6.1.).

Sweetpotato roots from selected commercial varieties and breeding lines were planted in a heated bed at NAHRC on April 9 for slip production. Slips 8-12 inches long of two sweetpotato lines were planted on June 14. Varieties were replicated four times. Plots contained two rows that were 40 feet long and 3.5 feet wide. Within-row spacing was one foot.

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory and consisted of (per acre) 50 lbs N, 50 lbs P2O5 and 90 lbs K2O total. Consult your local county Extension agent for current recommendations for pest and weed control in vegetable production in Alabama.

Sweetpotatoes were harvested on September 15. Roots were graded as US #1 (roots 2 to 3.5 inches in diameter, three to nine inches in length, well-shaped and free of defects), canner (roots one to two inches in diameter, two to seven inches in length), jumbo (roots that exceed the diameter, length, and weight requirements of the US #1 grade, but that are of marketable quality), or cull (roots at least one inch in diameter but so misshapen or unattractive that they could not be classified as marketable roots). Marketable yield was calculated by adding the yields of the US #1, canner and jumbo grades. Percent US #1 was calculated by dividing the yield of the US #1 grade by the marketable yield (Table 6.2).

Table 6.1

Ratings of the 2012 Sweetpotato Collaborators' Trial[1]

Location	NAHRC
Weather	5
Fertility	5
Irrigation	5
Pests	5
Overall	5

[1]See introduction for description of ratings scales.

Table 6.2

Yield and Grade Distribution of Selected Sweetpotato Breeding Lines and Cultivars

Selection	US #1 bu/ac	Canner bu/ac	Jumbo bu/ac	Cull bu/ac	Market bu/ac	US#1 %
L 07-146	546	146	33	20	704	74
Beauregard B 94-14	337	153	115	41	605	56
L 05-111 Orleans	332	182	119	22	633	52
Beauregard B-63	258	170	92	18	519	50
O'Henry	238	165	27	10	429	55
Bonita	230	186	25	45	496	64
NC 07-847	212	130	91	55	433	50
Evangeline	208	123	35	28	367	56
NC 05-198	166	61	13	156	239	68
NC 07-364	145	127	1	7	310	60
Covington	138	186	35	44	360	38
NC 04-032	136	134	1	44	324	42
r^2	0.82	0.40	0.50	0.80	0.80	0.60
CV	25	35	94	59	20	19
LSD	88	74	113	97	180	37

Averages yields are given on a per acre basis. * = breeding lines; ** = Modified versions of 'Beauregard'
US #1's - Roots 2" to 3 1/2" diameter, length of 3" to 9", must be well shaped and free of defects.
Canners - Roots 1" to 2" diameter, 2" to 7" in length.
Jumbos - Roots that exceed the diameter, length and weight requirements of the above two grades, but are of marketable quality.
Percent US #1's - Calculated by dividing the weight of US #1's by the total marketable weight (Culls not included).
Culls - Roots must be 1" or larger in diameter and so misshapen or unattractive that they could not fit as marketable roots in any of the above three grades.

Few Pumpkins Varieties Reach Weight Class

Joe Kemble, Edgar Vinson and Arnold Caylor

A pumpkin variety trial was conducted at the North Alabama Horticulture Research Center (NAHRC) in Cullman, AL (Tables 7.1 and 7.2).

Fifteen pumpkin varieties were direct-seeded on July 16, 2012. Experimental plots were 50 feet long and placed on 10-foot centers. Plots were covered in white plastic mulch and drip irrigation was installed.

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory. Current pumpkin production information for Alabama, including insect, disease and weed management as well as recommended fertigation and spray schedules, is available in the Southeastern U.S. Vegetable Crop Handbook. Copies are available from your county Extension office or online at www.thegrower.com/south-east-vegetable-guide.

Pumpkins were harvested on October 17. Color development stops once pumpkins are harvested and therefore, pumpkins were harvested at full-color stage and were graded as marketable. Non-marketable fruit data were not included (Table 7.3).

The variety ‘Appalachian’ was used as the market standard. Two varieties, ‘Mustang’ and ‘Challenger’ produced marketable yields that were statistically higher than the market standard variety. Varieties that produced similar yields to ‘Mustang’ and ‘Challenger’ were ‘Corvet,’ ‘Cougar,’ and ‘Camero.’ Pumpkin weight classes ranged from 8 to 27 pounds. The varieties ‘Cougar’ and ‘Hanibal’ were in the 10 to 12 and 8 to 12 pound weight classes respectively. These varieties were the only two entries to produce individual fruit weights within their corresponding classes with ‘Cougar’ producing an individual fruit weight of 10.57 pounds and ‘Hannibal’ producing and individual fruit weight of 11.09 pounds.

Table 7.1
Ratings of 2012 Pumpkin Variety Trial

Location	NAHRC
Weather	5
Fertility	5
Irrigation	5
Pests	5
Overall	5

[1]See introduction for description of ratings scales.

Table 7.2
Seed Source, Earliness and Weight Class of Selected Pumpkin Varieties

Variety	Type	Seed source	Maturity (days)	Fruit Weight (lbs)
Appalachian	F_1	Seminis	90	20-25
Early Pack	F1	Sakata	95	18-20
Mustang	F1	Hollar	100	18-24
Diablo	F1	Sakata	100	16-22
Goode Bumps II	F1	Siegers	95	8-12
Knuckle Head	F1	Siegers	105	12-16
Challenger	F1	Hollar	100	22-27
Cougar	F1	Hollar	80	10-12
Camero PMR	F1	Hollar	110	20-23
Gold Gem	F1	Rupp	105	22
Octoberfest	F1	Sieger	95	16-22
Hannibal	F1	Hybrid Seed Co./Siegers	95	8-12
Corvette PMR	F1	Siegers	110	12-16
Wolf	-	Siegers	120	15-25
Phatso Jr.	F1	Siegers	115	15-25

F1=hybrid; OP=open pollinated
- = Not found; from seed catalogues

Table 7.3

Yield of Selected Pumpkin Varieties

Variety	Marketable Yield (lbs/ac)	Marketable Number (#/ac)	Individual Fruit Weight (lbs)
Mustang	20,837	1,653	11.0
Challenger	19,788	1,436	12.54
Corvette PMR	16,062	1,718	9.19
Cougar	16,004	1,479	10.57
Camero	15,777	1,392	10.52
Phatso Jr.	12,258	1,088	11.35
Goosebumps	11,619	2,066	5.56
Appalachian	10,640	914	10.67
Diablo	10,629	1,283	7.37
Knucklehead	8,970	1,153	7.07
Earlypack	8,848	914	9.70
Gold Gem	7,584	718	9.06
Octoberfest	7,432	783	9.81
Hanibal	6,097	544	11.09
Wolf	4,800	406	10.49
r^2	0.75	0.72	0.72
CV	42	37	21
LSD	7,168	620	2.95

Observational Trials Signal Advancement of Several Ornamental and Popcorn Varieties to Replicated Trials

Joe Kemble, Edgar Vinson and Arnold Caylor

An observational ornamental corn variety trial was conducted at the North Alabama Horticulture Research Center (NAHRC) in Cullman, Alabama (Tables 8.1 and8.2). Thirty-one ornamental and popcorn varieties were direct-seeded on bare ground. Each variety was represented in 20-foot-long plots. Plants were spaced six feet between rows and six inches within a row.

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory. Current pumpkin production information for Alabama, including insect, disease and weed management as well as recommended fertigation and spray schedules, is available in the Southeastern U.S. Vegetable Crop Handbook. Copies are available from your county Extension office or online at www.thegrower.com/south-east-vegetable-guide.

Most popcorn varieties received top rating for tip cover (Table 8.3). For overall eye appeal, 'Chocolate Cherry,' 'Laser Pretty Pop,' 'Carousel,' and 'Red Husk Spectrum' exhibited the highest ratings among other popcorn varieties of 4 out of 5. Varieties 'Robust 997' and 'Cherokee Long Small Ear' both received a rating of 4 out of 5 the tip cover category. Varieties that produced the three highest marketable yields were 'Cherokee Long Small Ear,' 'Strawberry' and 'Robust 997.' In marketable ear number 'Robust 997,' 'Top Pop' and 'Pennsylvania Butter Flavored' were the top three performing varieties.

The top three performing ornamental varieties in marketable yield (Table 8.4) were 'Miniature Colored Popcorn,' 'Carousel' and 'Early Supreme.' Varieties that produced the three highest marketable ear numbers per acre were 'American Way' 'Stubbs Orange' and 'Bloody Butcher' (Table 8.4). 'Miniature Colored Popcorn' and 'Carousel' received among the highest quality scores of 5 out of 5 and 4 out of 5 for tip cover and eye appeal, respectively.

Observational trials allow for the screening of many varieties. In order to get a clearer picture of the performance of a cultivar, observational trials should be followed up with replicated trials that include top performing varieties. Popcorn varieties 'Chocolate Cherry,' 'Laser Pretty Pop,' 'Carousel,' and 'Red Husk Spectrum,' and 'Robust 997.' The ornamental varieties 'Robust 997,' 'American Way,' 'Stubbs Orange' and 'Bloody Butcher among others should be considered for inclusion in a replicated trial.

ORNAMENTAL CORN

Bloody Butcher

Neon Pink

Pungo Creek Butcher

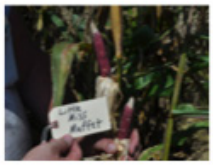
Strawberry

Early Supreme

Blue Clarage

Cherokee Long Small Ear

Shades of Blue



Little Miss Muffet

Fiesta

Dakota Black

Pennsylvania Butter Flavored

Strubbs Orange

Indian Fingers

Red Husk Spectrum

Top Pop

Wilda's Pride

Jerry Peterson Blue

Carousel

American Pride

Laser Pretty Pop

Red Stalker

American Way

Underwoods


Painted Mountain


Earth Tones Dent


Gorgeous Indian


Arnold's Purple


Arnold's Mixed


Robust 997


Dynamite


Chocolate Cherry


Mini Colored Popcorn


Red Beauty


Mini Blue Popcorn


Underwoods

Table 8.1

Ratings of the 2012 Ornamental Corn Trial[1]

Location	NAHRC
Weather	5
Fertility	5
Irrigation	5
Pests	5
Overall	5

[1]See introduction for description of ratings scales.

ORNAMENTAL CORN

Table 8.2
Yield of Selected Ornamental and Popcorn Varieties at the North Alabama Horticulture Research Center

Variety	Type	Seed source	Days to Harvest	Ear Length (in)
Miniature Colored Popcorn	Ornamental	Seedway	105	-
Cherokee Long Small Ear	Popcorn	Southern Exposure	100	5-7
Strawberry	Popcorn	Rupp	100	2
Robust 997	Popcorn	Johnny's	112	7-8
Red Husk Spectrum	Popcorn	Siegers	100	6
Little Miss Muffet	Ornamental	Bobby Seeds	110	2-4
Penn. Butter Flavored	Popcorn	Southern Exposure	102	4-6
Top Pop	Popcorn	Harris	100	-
Neon Pink	Popcorn	Siegers	110	3-4.5
Red Beauty	Ornamental	Johnny's	120	6-7
Laser Pretty Pop	Popcorn	Siegers	95	4-6
Dynamite	Popcorn	Sustainable	110	7
Mini Blue Popcorn	Ornamental	Seedway	105	2-4
Dakota Black	Popcorn	Sustainable	90	-
Chocolate Cherry	Popcorn	Southern Exposure	120	-
Shades of Blue	Popcorn	Siegers	110	3.5-4.5
Carousel	Popcorn	Siegers	110	4
Early Supreme	Ornamental	-	-	-
Gorgeous Indian	Ornamental	Siegers	107	8.5-9
Fiesta	Ornamental	Rupp	100	8
Red Stalker	Ornamental	Harris	105	7-8
Indian Fingers	Popcorn	Rupp	100	2.5-4.5
Wilda’s Pride	Ornamental	Harris	110	8-11
Stubbes Orange	Ornamental	Johnny's	100	7-8
Bloody Butcher	Ornamental	Siegers	110	8-12
Earth Tones Dent	Ornamental	Harris	90	8-10
Jerry Peterson Blue	Ornamental	Johnny's	105	7-8
American Pride	Ornamental	Siegers	105	9
American Way	Ornamental	Siegers	115	10-13
Arnold's Purple	Ornamental	Auburn University	-	-
Underwoods	Ornamental	Harris	100	9-11
Blue Clarage	Ornamental	Southern Exposure	100	-
Pungo Creek Butcher	Ornamental	Southern Exposure	-	9-12
Arnold's Mixed	Ornamental	Auburn University	-	-

Table 8.3

Plant Quality Characteristics of Selected Ornamental Corn Varieties at The North Alabama Horticulture Research Center

Variety	Type	Tip Cover Rating	Ear Fill Rating	Eye Appeal Rating	Ear Length in.	Ear Diameter in.
Pungo Creek Butcher	Ornamental	5	2	4	7	2
Mini Blue Popcorn	Ornamental	5	3	3	3	1
Little Miss Muffet	Ornamental	5	3	4	4	1
Jerry Peterson Blue	Ornamental	5	3	3	8	2
Wilda's Pride	Ornamental	5	3	3	8	1
Arnold's Purple	Ornamental	5	3	4	7	2
Blue Clarage	Ornamental	5	3	4	7	2
Miniature Colored Popcorn	Ornamental	5	3	4	4	1
American Pride	Ornamental	4	3	3	8	2
Underwoods	Ornamental	4	4	4	7	1
Earth Tone Dent	Ornamental	4	3	2	6	2
Early Supreme	Ornamental	3	3	4	8	1
Red Stalker	Ornamental	3	3	4	8	1
Fiesta	Ornamental	3	3	3	8	1
Gorgeous Indian	Ornamental	3	3	3	9	2
Strubbs Orange	Ornamental	3	3	3	7	2
Top Pop	Ornamental	3	3	4	8	1
Red Beauty	Ornamental	2	2	3	7	1
Bloody Butcher	Ornamental	2	2	3	7	2
Red Husk Spectrum	Popcorn	5	3	4	5	1
Penn Butter Flavored	Popcorn	5	3	3	5	1
Dynomite	Popcorn	5	2	2	7	1
Dakota Black	Popcorn	5	3	3	5	1
Chocolate Cherry	Popcorn	5	3	4	6	1
Laser Pretty Pop	Popcorn	5	3	4	4	1
Indian Fingers	Popcorn	5	4	5	5	1
Neon Pink	Popcorn	5	4	3	5	1
Carousel	Popcorn	5	4	4	5	1
Robust 997	Popcorn	4	2	3	8	1
Cherokee Long Small Ear	Popcorn	4	2	3	6	1

Tip cover, ear fill, and eye appeal ratings: 5=excellent, 4=good, 3=fair, 2=poor, and 1=very poor.

ORNAMENTAL CORN

Table 8.4

Yield of Selected Ornamental Corn Varieties

Variety	Type	Marketable Ear Yield lbs/ac	Marketable Ear Number #/ac
Cherokee Long Small Ear	Popcorn	53,631	6,530
Strawberry	Popcorn	49,005	4,167
Robust 997	Popcorn	48,642	11,921
Red Husk Spectrum	Popcorn	46,827	5,293
Little Miss Muffet	Popcorn	43,197	4,156
Penn. Butter Flavored	Popcorn	42,108	7,692
Top Pop	Popcorn	40,656	7,928
Neon Pink	Popcorn	39,930	3,202
Red Beauty	Popcorn	30,129	6,795
Laser Pretty Pop	Popcorn	27,588	2,875
Dynamite	Popcorn	27,225	4,069
Mini Blue Popcorn	Popcorn	18,876	1,220
Dakota Black	Popcorn	15,246	2,559
Chocolate Cherry	Popcorn	14,157	2,948
Shades of Blue	Popcorn	7,986	875
Miniature Colored Popcorn	Ornamental	75,141	5,307
Carousel	Ornamental	41,382	4,654
Early Supreme	Ornamental	33,033	9,257
Fiesta	Ornamental	31,944	9,910
Gorgeous Indian	Ornamental	31,218	12,498
Fiesta	Ornamental	29,403	9,046
Red Stalker	Ornamental	26,499	7,151
Indian Fingers	Ornamental	23,595	2,080
Wilda’s Pride	Ornamental	23,232	8,541
Stubbs Orange	Ornamental	22.869	12,197
Bloody Butcher	Ornamental	22,506	11,068
Earth Tones Dent	Ornamental	21,780	7,565
Jerry Peterson Blue	Ornamental	20,691	8,396
American Pride	Ornamental	18,150	9,148
American Way	Ornamental	31,944	12,926
Arnold’s Purple	Ornamental	31,218	6,106
Underwoods	Ornamental	12,705	4,545
Bllue Clarage	Ornamental	3,267	4,541
Pungo Creek Butcher	Ornamental	7,260	3,252
Arnold’s Mixed	Ornamental	3,267	1,437

Tomato Trials, 2012

George Boyhan, Suzzanne Tate and Ryan McNeil

Tomatoes are an important and profitable for the state of Georgia, with almost 3,000 acres devoted to tomatoes, valued at almost $25 million (Wolfe & Luke-Morgan, 2011). Most all of these are produced conventionally. This trial, however, evaluated tomatoes under organic production practices on plastic mulch. Varieties chosen included both commercial varieties commonly grown in the Southeast as well as entries that are popular among organic growers. Included were varieties that were both determinate and indeterminate with some that could be characterized as semi-determinate.

Overall, common commercial types, such as 'Celebrity' and 'BHN 602,' produced greater yield with more uniform fruit. Varieties popular with organic growers included pink varieties, varieties with more sutures and smaller types. This experiment adhered to the guidelines from the National Organic Program (NOP) for certified organic production. The experiment was conducted on land in transition to organic production.

Seed were sown into an organic media in the greenhouse on March 8, 2012 and transplanted on April 17, 2012. The soil type was a Cecil Sandy Loam. All fertilizers were pre-plant incorporated organic fertilizers. The amount of fertilizer used supplied 120-150-176 of N-P2O5-K2O. Plants were transplanted into plastic covered beds with a six-foot, between-row spacing and 18 inches in-row spacing. Each plot or experimental unit consisted of five plants with 45 square feet per plot. The experiment was arranged in a randomized, complete block design with three replications.

Tomatoes were staked and strung up with three courses of string. Plants were irrigated with under plastic drip irrigation. Tomatoes were harvested beginning on July 5, 2012 and continued every three to five days until August 10,2012. Harvested fruit were graded into large (≥2.5 inches) and medium (<2.5 inches) size classes. Data are presented with early and total yields. Early yields include all data collected July 5 through July 17, 2012. Data were analyzed with an analysis of variance and Fisher's Protected Least Significant Difference (LSD) and the coefficient of variations (CV) were calculated.

The best early-yielding varieties were 'HSX 8115H' and 'Celebrity,' which performed better than all other entries. The entry with the highest total yield was 'Celebrity.' These varieties are modern, commercial varieties suitable for staked tomato production.

Many of the varieties were indeterminate types, which were not well suited to staked tomato production. Although varieties popular with organic growers did not produce as well as conventional commercial entries, they often will command much higher prices, resulting in greater return per acre for the grower. In conclusion, organic production may offer growers better returns because of higher prices. The indeterminate nature of many of the entries popular with organic growers will require modifications in production, in particular using longer stakes with more pruning and efforts at trellising.

Table 9.1

Ratings of the 2012 Tomato Variety Trial[1]

Location	Durham Horticulture Farm[2]
Weather	5
Fertility	5
Irrigation	5
Pests	4
Overall	4

[1]See introduction for description of ratings scales.
[2]Soil type: Cecil Sandy Loam, Water-holding capacity (in./in) 0.33-0.35.

Table 9.2
Seed source for the Tomato Varieties

Variety Name	Seed Source
Mountain Fresh Plus	SeedWay
BHN 602	SeedWay
Fletcher 0377	SeedWay
Celebrity	Harris Seed
Scarlet Red	Harris Seed
Ozark Pink	Southern Exposure Seed Exchange
Druzba	Southern Exposure Seed Exchange
Neptune	Southern Exposure Seed Exchange
Mortgage Lifter VFN Red	Southern Exposure Seed Exchange
Cherokee Purple	Southern Exposure Seed Exchange
Abraham Lincoln	Southern Exposure Seed Exchange
Crnkovic Yugoslavian	Seed Savers Exchange
Jeff Davis	Tomato Fest
Costoluto Fiorentino	Tomato Growers
Florida Pink	Tomato Growers
RFT 80771	Rogers/Syngenta
RFT 80772	Rogers/Syngenta
HMX 8847 f1	Harris Moran
HSX 8115H	Hortag Seeds

Table 9.3

Tomato Variety Trial Yield Grown Under Organic Conditions, 2012

	Early Yield[z]				
	lbs/ac				
Variety	Large	Medium	Total	Number/ac	Average Fruit Weight (oz)
Florida Pink	1,112	1,126	2,923	7,993	5.9
Mortgage Lifter VFN	584	3,383	4,269	7,828	8.7
Jeff Davis	4,417	3,112	7,678	11,551	10.6
Ozark Pink	52	8,867	9,080	44,444	3.3
RFT 80772	850	11,826	12,956	32,323	6.4
Neptune	0	13,081	13,081	52,992	3.9
RFT 80771	1,870	12,128	14,102	37,229	6.1
Crnkovic Yougoslavian	2,181	10,998	14,428	26,552	8.7
Abraham Lincoln	509	14,469	14,989	46,084	5.2
Druzba	0	15,585	17,976	43,754	6.6
Cherokee Purple	5,761	16,306	22,416	40,650	8.8
Scarlet Red	1,180	21,408	23,541	61,610	6.1
HMX 8847 F1	4,375	17,791	23,856	58,031	6.6
Mountain Fresh Plus	6,968	26,535	34,683	80,192	6.9
BHN 602	16,347	18,854	36,302	70,763	8.2
Costoluto Fiorentino	84	34,584	37,031	121,321	4.9
Fletcher 0377	2,948	39,480	43,750	106,383	6.6
Celebrity	4,492	45,725	55,650	113,980	7.8
HSX 8115H	2,320	54,873	57,249	141,932	6.5
Coefficient of variation	54%	22%	19%	20%	
Fisher's Protected LSD (P≤0.05)	1,569	2,169	1,966	5,660	

[z]Early yield: 7/5-17/12.

Table 9.4

Tomato Variety Trial Yield Grown Under Organic Conditions, 2012

	Early Yield[z]					
	lbs/ac					
Variety	Large	Medium	Total	Number/ac	Average Fruit Weight (oz)	Growth Habit
Florida Pink	10,369	6,376	17,893	30,992	9.2	Semi-determinant
Mortgage Lifter VFN	3,845	17,606	22,318	48,271	7.4	Determinant
Jeff Davis	7,046	14,698	22,372	67,414	5.3	Indeterminate
Ozark Pink	52	30,632	30,772	146,651	3.4	Indeterminate
RFT 80772	5,302	35,804	41,584	112,468	5.9	Semi-determinant
Neptune	0	32,083	32,083	171,669	3.0	Indeterminate
RFT 80771	5,050	40,129	45,637	140,594	5.2	Semi-determinant
Crnkovic Yougoslavian	3,686	19,820	24,666	57,440	6.9	Semi-determinant
Abraham Lincoln	509	25,481	26,010	90,591	4.6	Indeterminate
Druzba	54	36,293	38,417	144,153	4.3	Semi-determinant
Cherokee Purple	7,892	23,922	32,178	61,580	8.4	Indeterminate
Scarlet Red	4,043	55,027	59,462	189,855	5.0	Determinant
HMX 8847 F1	5,927	34,425	42,710	135,029	5.1	Semi-determinant
Mountain Fresh Plus	9,971	56,607	68,513	194,607	5.6	Semi-determinant
BHN 602	22,936	48,716	72,660	199,287	5.8	Determinant
Costoluto Fiorentino	416	47,183	50,842	180,217	4.5	Semi-determinant
Fletcher 0377	3,544	62,770	68,006	194,329	5.6	Determinant
Celebrity	5,749	89,238	99,950	273,581	5.8	Determinant
HSX 8115H	2,320	73,230	75,639	213,313	5.7	Semi-determinant
Coefficient of variation	45%	15%	14%	16%		
Fisher's Protected LSD (P≤0.05)	2,114	2,329	2,481	9,146		

[z]Total yield: 7/5-8/10/2012

Watermelon Variety Trial, 2012

George Boyhan, Suzzanne Tate and Ryan McNeil

Watermelons are an important crop in Georgia, accounting for 15 percent of the vegetable acreage state wide. In 2009, the last year of available data, watermelon ranked first in both total acres in Georgia as well as in revenue generated at $139 million (Boatright & McKissick, 2010). Commercial watermelon production has largely shifted to the production of triploid or seedless varieties, which account for about two-thirds of the crop. There is still, however, an important local industry in seeded watermelons. This is particularly true for organic growers who are interested in open-pollinated varieties where they can save their own seed. There were seven entries in this trial and there were no differences in total yield between the entries. Five of the entries were seedless types and two were open-pollinated.

Seeds were sown in the greenhouse on May 15 and 24, and transplanted to the field on June 8, 2012. Plants were grown on white plastic with a six-foot, between-row spacing and a four-foot, in-row spacing. The experiment was arranged as a randomized, complete block design with four replications. Plants were grown according to the University of Georgia Cooperative Extension Service's recommendations. Yield per plot and fruit characteristics of two fruit per plot were measured. Fruit characteristics included soluble solids, which is a measure of percent sugar content, as well as firmness, which was measured with a penetrometer with an eight-millimeter probe. Plants were grown according to University of Georgia Extension Service's recommendations for watermelon production on plastic mulch.

There were several different types of watermelons in the trial including F1 seedless and open-pollinated varieties (Table 10.2). 'Moon and Stars' is an old open-pollinated variety with an unusual rind pattern of yellow spots. The variety grown in this trial was a yellow fleshed variant. 'AU-Producer' is an open-pollinated Crimson Sweet type. It was developed at Auburn University as a disease resistant variety.

The remaining entries, 'Sugar Coat,' 'Troubadour,' 'Sugar Heart,' 'Fascination,' and 'Crunchy Red' are all F1 triploid or seedless varieties. These varieties tend to be very uniform, high yielding melons. They are small, round Crimson Sweet type melons. They also have good sugar content. Seedlessness is a function of the odd number of chromosomes (3n), which prevents seed development. There are small white undeveloped seed present that are called pips.

There were differences for the number of melons per acre. ‘Sugar Coat,’ ‘Crunchy Red’ and ‘Trubadour’ had the greatest number of fruit, which were significantly more than ‘Moon & Stars’ and ‘AU-Producer’ (Table 10.2). Both ‘Moon & Stars’ and ‘AU-Producer’ produced larger fruit, which is often a function of the number of fruit per acre. Varieties that produce larger fruit usually have fewer fruit per acre.

There were no differences in soluble solids between the entries. The firmness of ‘Crunchy Red’ was significantly better than all the entries except ‘Facination.’ In conclusion, variety trials can be a valuable source of variety information. However, results should be measured over several years to develop a true picture of their potential.

Table 10.1

Ratings of the 2012 Watermelon Variety Trial[1]

Location	Durham Horticulture Farm[2]
Weather	5
Fertility	5
Irrigation	5
Pests	4
Overall	5

[1]See introduction for description of rating scales.
[2]Soil type: Cecil Sandy Loam, Water-holding capacity (in./in) 0.33-0.35.

Table 10.2

Watermelon Variety Trial Yields and Fruit Characteristics, 2012

Variety	Yield (lbs/ac)	Count (#)	Fruit Weight (lbs)	In. Length	In. Width	In. Rind Thickness	Soluble Solids (%)	Firmness (lbs/in)	Fruit Type
Moon & Stars (yellow)	20,419	1,588	13.2	14.0	7.7	0.76	9.2	1.19	Open-pollinated, yellow flesh
Sugar Coat	37,661	3,675	10.8	11.0	8.1	0.78	11.5	1.33	F1 Seedless
AU Producer	25,229	1,815	13.8	10.4	9.0	0.67	10.6	1.31	Open-pollinated, Crimson Sweet type
Trubadour	32,330	3,494	9.2	10.2	7.6	0.58	10.3	1.40	F1 Seedless
Sugar Heart	27,543	2,632	10.5	10.0	8.3	0.73	10.4	1.28	F1 Seedless
Fascination	30,991	2,723	11.7	10.0	8.3	0.64	10.9	1.46	F1 Seedless
Crunchy Red	30,855	3,630	8.7	10.3	7.9	0.58	10.2	1.72	F1 Seedless
Coefficient of Variation:	30%	32%	17%	6%	6%	17%	10%	13%	
Fisher's Protected LSD (P≤0.05)	NS[z]	1,325	2.9	1.0	0.7	NSz	NSz	0.27	

[z]NS - Non-significant

Pumpkin Variety Trials, 2012

George Boyhan, Suzzanne Tate, Ryan McNeil and Billy Mills

Pumpkins are a difficult crop to produce in Georgia. There were only 415 acres of pumpkins produced in 2009, primarily in north Georgia (Boatright & McKissick, 2010). There are several diseases that affect pumpkins with the most severe including powdery mildew (Erysiphe cichoracearum), downy mildew (Pseudoperonospora cubensis) and a variety of potyviruses.

Potyviruses are particularly problematic in the fall because they are transmitted by aphids. Aphid populations tend to build throughout the spring, summer, and fall with maximum populations occurring in the fall. Particularly in south Georgia, these viruses can be devastating resulting in unreliable production from one year to the next.

There were 14 entries in the trial with two planting locations. The trial in Watkinsville, GA had yields that ranged from 55 pounds per acre to 28,122 pounds per acre. The highest yielding entry was 'Orange Bulldog.' Other entries that did well included '18-4-3,' '18-4-2' and 'Field Trip F1.' The first three are Cucurbita maxima species, developed at the University of Georgia, and 'Field Trip F1' is a Harris Moran variety.

Pumpkin seeds were sown on July 9, 2012 in artificial media in the greenhouse at the Durham Horticulture Farm in Watkinsville, GA. These seedlings were transplanted to the field three weeks after sowing in rows with a 12-foot, between-row spacing and a six-foot, in-row spacing. Plants were grown according to University of Georgia extension service recommendations. The experiment was arranged as a randomized complete block design with four replications. There were 10 plants of each variety in each replication.

Pumpkins were harvested October 24, 2012 and the number of fruit and the total weight were recorded for each experimental unit or plot.

This experiment was replicated at the Attapulgus Research & Education Center in Attapulgus, Georgia. However, due to severe disease and insect infestation, this trial was not harvested and was evaluated on September 14, 2012 for disease. This evaluation was on a 1 to 9 scale, with 1 indicating no disease and 9 having severe infection. Data were analyzed with analysis of variance and Fisher's Protected Least Significant Difference (LSD) and the coefficient of variation (CV) were calculated.

PUMPKIN

The highest yielding entry was 'Orange Bulldog,' a variety released by the University of Georgia. This was significantly greater than any other varieties in the trial. The next greatest entry was '18-4-3,' an advanced line, which is being considered for release.

Among the commercial varieties, 'Field Trip F1' had the greatest yield, which was significantly better than the other commercial entries. The best entries based on disease rating in Attapulgus were 'Orange Bulldog' and 'Field Trip F1.'

In the Watkinsville, Georgia trial, both powdery and downy mildew infections were severe. These diseases dramatically affected yields. 'Field Trip F1' among the commercial varieties performed well considering the severe disease pressure. This is a self-heading type with a small fruit, averaging 4.1 pounds.
At the Attapulgus, Georgia farm, there was severe virus pressure as well as a severe infestation of whiteflies. They had heavy rains immediately after planting and this, coupled with the disease and insect pressure, precluded harvest. The disease ratings were best with 'Orange Bulldog' and 'Field Trip F1,' with 1.4 and 1.7, respectively, on a 1-9 rating scale with 1 indicating no disease and 9 indicating severe disease symptoms.

In conclusion entries developed at the University of Georgia continue to perform well with the potential for new releases in the near future.

Table 11.1

Ratings of the 2012 Pumpkin Variety Trial[1]

Location	Durham Horticulture Farm	Attapulgus Research & Education Center
Weather	5	5
Fertility	5	5
Irrigation	5	5
Pests	2	1
Overall	3	3

[1]See introduction for description of rating scales.
Note: Soil types: Durham Horticulture Farm: Cecil Sandy Loam (Water Holding Capacity-0.33-0.35 in/in), Attapulgus Res. & Edu. Center: Dothan Loamy Sand (Water Holding Capacity-0.33-0.35 in/in).

Table 11.2

Evaluation of Pumpkin Varieties in Watkinsville and Attapulgus, GA, 2012

Variety	Watkinsville, GA			Attapulgus, GA
	Yield (lbs/ac)	Number (ac)	Fruit Weight (lbs)	Rating[z]
Crunchkin F1	395	1,048	0.4	8.0
Little Giant F1	2,910	1,165	2.5	4.6
Magic Wand F1	6,875	950	7.2	7.0
Munchkin	55	350	0.2	8.5
Aladdin F1	532	88	6.0	7.7
Field Trip F1	9,803	2,377	4.1	1.7
Magic Lantern F1	6,238	576	10.8	7.5
Howden	132	30	4.4	7.2
YSK-300	481	176	2.7	4.6
YSK-301	461	187	2.5	5.9
Orange Bulldog	28,122	4,563	6.2	1.4
18-4-2	13,790	1,200	11.5	3.4
18-4-3	23,650	1,952	12.1	3.8
Jack-O-Lantern	238	105	2.3	7.7
Coefficient of variation	57%	56%		12%
Fisher's Protected LSD (P≤0.05)	2,576	4		0.2

[z]Disease rating: 1-no disease, 9-severe disease symptoms

Seed Sources

Sakata
P.O. Box 880
Morgan Hills, CA
95038-0880
Tech. Rep: Jay Jones
239-289-2130

Sieger Seed Co.
13031 Reflections Drive
Holland, MI 49424
1-800-962-4999
Fax: (616) 994-0333

Harris Seeds
To Order: (800) 544-7938
P.O. Box 22960
60 Saginow Dr.
Rochester, NY 14692-2960

Johnny's Select Seeds
955 Benton Ave
Winslow, ME 04901
(207) 861-3900
info@johnnyseeds.com

Harris Moran
P.O. Box 4938
Modesto, CA 95352
Tech Rep: Terry Kelly
(229) 947-3253
t.kelly@hmclause.com

Takii
301 Natividad Road
Salinas, CA 93906
(831) 443-4901

Territorial Seed Co.
P.O. Box 158
Cottage Grove, OR 97424
(888) 657-3131
info@territorialseeds.com

Seminis Vegetable Seeds, Inc
Tech Rep: Rusty Autry
2221 North Park Ave.
Tifton GA 31796
Ph: (229) 386-0750

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Hartford, AL 36344
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