Fall 2008-2010 Commercial Fruit and Vegetable Variety Trials

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Names of chemicals are mentioned only for describing the production practices used. This represents neither a recommendation nor an endorsement of these products.

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Introduction: Interpreting Vegetable Varieties Performance Results

Edgar Vinson and Joe Kemble

The fall 2008-2010 fruit and vegetable regional bulletin includes research results from Auburn University, the University of Georgia, and North Carolina State University. 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 help producers adequately interpret results in this report.

Open pollinated or hybrid varieties. In general, hybrids (also referred to as F_1) are earlier and produce a more uniform crop. They have improved disease, pest, or virus tolerance/resistance. F_1 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 still often 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 by just looking at the range of yields actually 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 (R^2), coefficient of variation (CV) and least significant difference (LSD, 5 percent) 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.

R^2 values range 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 (under 20 percent) are desirable 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 2010 Chinese cabbage trial presented in this issue conducted at the E.V. Smith Research Center, 'Rubicon' yielded 24,826 pounds per acre, while 'China Star' and 'China Gold' yielded 23,732 and 21,357 pounds per acre, respectively. Since there was less than a 3,430 difference between 'Rubicon' and 'China Star', there is no statistical difference between these two varieties. However, the yield difference between 'Rubicon' and 'China Gold' was 3,469, 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 conditions. AU vegetable variety trials are conducted under standard, recommended commercial production practices. All of Auburn University's commercial vegetable production recommendations can be found in the current edition of 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. Additional information on any aspect of vegetable production can be obtained from your county Extension office or online at www.aces.edu. Information on soil type (Table 1), 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 2). 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 Seed Sources, page 40.

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.

Fruit and vegetable trials on the Web. For more vegetable variety information be sure to visit our Web page at www.aces.edu/depart/com_veg/veg_trial/vegetabl.htm.This website provides descriptions of variety types, a ratings system, and information about participating seed companies.

TABLE 1. SOIL TYPES AT THE LOCATION OF THE TRIAL

Location	Water holding capacity (in/in)	Soil type
Gulf Coast Research and Extension Center (Fairhope)	0.09-0.19	Malbis fine sandy loam
Brewton Agricultural Research Unit (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

TABLE 2. 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

Asparagus in North Alabama, 2010

Joe Kemble, Edgar Vinson, and Arnold Caylor

An asparagus variety trial was conducted at the North Alabama Horticulture Research Center (NAHRC) in Cullman, Alabama (Tables 1and 2).

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory. For current recommendations for pest and weed control in vegetable production in Alabama, consult your county extension agent or go online to www.aces.edu/counties.

Asparagus spears were harvested 20 times between April 1 and May 22. Asparagus spears were graded according to the United States Standards for Grades of Fresh Asparagus (www.ams.usda.gov/standards/stanfrfv.htm) as marketable or unmarketable (Table 3).

'New Jersey 1018', positioned at the top of the list in total marketable yield, had yields significantly higher than 'Jersey King' and 'New Jersey 938' in this category. All other varieties had yields that were statistically similar to 'New Jersey 1018'. 'New Jersey 938' finished the season at the bottom of the list; however, yields of 'New Jersey 938' were statistically similar to more than half of the varieties.

'New Jersey 938' produced the highest weight of unmarketable spears per acre. Unmarketable fruit weight was statistically higher than all other varieties with the exception of 'Jersey Deluxe'.

TABLE 1. RATINGS OF THE 2010 ASPARAGUS VARIETY TRIAL[1]

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

[1] See introduction for description of ratings scales.

TABLE 2. FRUIT TYPE AND DISEASE CLAIMS OF SELECTED ASPARAGUS VARIETIES

Variety	Type	Breeding location	Disease claims[1]
New Jersey 1018	—	—	—
New Jersey 990	—	—	—
New Jersey 978	All-male	—	—
New Jersey 1053	—	—	—
Jersey Giant	All-male	New Jersey	CR, FW, R,
Jersey Supreme	All-male	New Jersey	FW,R
Jersey Knight	All-male	New Jersey	CP, CR, W,R,RR
New Jersey 1064	All-male	—	—
Jersey Deluxe	All-male	—	—
New Jersey 977	All-male	New Jersey	—
Jersey King	All-male	—	—
New Jersey 938	—	—	—

[1] Disease claims: CR= Crown rot; FW = Fusarium wilt; R= Rust; RR, CP = Cercospora.
— = information not available

TABLE 3. YIELD OF SELECTED ASPARAGUS VARIETIES

Variety	Marketable spear yield *lb/A*	Marketable spear number *no/A*	Unmarketable spear yield *lb/A*	individual spear weight *oz*
New Jersey 1018	3,056	100,376	200	0.49
New Jersey 990	2,941	97,114	152	0.49
New Jersey 978	2,757	99,180	203	0.44
New Jersey 1053	2,751	100,920	183	0.44
Jersey Giant	2,750	93,743	213	0.47
Jersey Supreme	2,561	86,456	197	0.47
Jersey Knight	2,537	83,629	173	0.48
New Jersey 1064 Purple	2,525	66,664	147	0.60
Jersey Deluxe	2,438	83,738	216	0.46
New Jersey 977	2,387	79,605	146	0.47
Jersey King	2,298	81,889	131	0.45
New Jersey 938	1,971	78,191	308	0.41
R^2	***0.53***	***0.51***	***0.41***	***0.77***
CV	***18***	***17***	***35***	***7***
LSD	***669***	***21,048***	***96***	***0.05***

Napa Chinese Cabbage Evaluated in Central Alabama, 2008

Joe Kemble, Edgar Vinson, and Jason Burkett

A Napa and Bok Choi Chinese cabbage variety trial was conducted at E.V. Smith Research Center (EVSRC) in Shorter, Alabama (Tables 1 and 2). Six-week-old, Napa cabbage varieties were transplanted onto plots that were 20 feet long on 6 foot centers on September 19. Plants within a row were spaced at 1.5 feet. White plastic mulch and drip irrigation were used.

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory. For current recommendations for pest and weed control in vegetable production in Alabama, consult your county extension agent online at www.aces.edu/counties.

TABLE 1. RATINGS OF THE 2008 CHINESE CABBAGE VARIETY TRIAL[1]

Location	EVSRC
Weather	5
Fertility	5
Irrigation	5
Pests	5
Overall	5

[1] See introduction for description of ratings scales.

Bok Choi varieties were harvested on November 11 and Napa varieties were harvested on November 20. Cabbage heads were weighed in the field (Table 3). Napa varieties 'Rubicon' and 'China Gold' produced the highest marketable yield in this year's trial. This was attributed to relatively high numbers of marketable heads and individual head weights. The varieties 'Yuki' and 'Minuet' were statistically similar. 'Bilko' was similar to 'Minuet' in total marketable yield but significantly lower than 'Yuki'. Individual head weight of 'Yuki' was lower than 'Rubicon', 'China Gold', and 'Minuet'. Total marketable yield remained among the highest because it had the lowest unmarketable head weight. However, no statistical differences in unmarketable head weight among varieties were found. This was likely due to high variability.

In the Bok Choi category, 'Joi Choi' surpassed 'Mei Qing Choi' by nearly 10,000 pounds per acre. This was because 'Mei Qing Choi' produced more than twice the number of unmarketable heads and the individual head weight of 'Mei Qing Choi' was significantly lower.

TABLE 2. TYPE, SEED SOURCE, AND DISEASE CLAIMS OF SELECTED CHINESE CABBAGE VARIETIES

Variety	Type	Seed source	Plant habit	Disease claims[1]	Color	Days to harvest
Joi Choi	Bok Choi	Johnny's Select	Upright	Bl	G	50
Mei Qing Choi	Bok Choi	Johnny's Select	Upright	Bl	G	45
Rubicon	Napa	Johnny's Select	Upright	Bl	G,Y	52
Minuet	Napa	Johnny's Select	Upright	BLSp,BR,DM	G,Y	48
China Gold	Napa	Sakata	Upright	—	G	—
Yuki	Napa	Sakata/Siegers	Upright	CR	G	67
Bilko	Napa	Johnny's Select	Upright	BLSp,CR,FY	G	54
Spring Flavor	Napa	Seminis/Siegers	Upright	DM	G	68

[1] Disease claims: BR=Bottom rot; BLSp = Black spot; Bl=Bolt tolerant; CR=Club root; DM = Downey mildew; FY=Fusarium yellow — = none; from seed catalogues.

TABLE 3. YIELD OF SELECTED CHINESE CABBAGE VARIETIES

Variety	Type	Total marketable yield *lb/A*	Total marketable number *no/A*	Unmarketable head number *no/A*	Individual head weight *lb*
Rubicon	Napa	22,521	6,534	908	3.45
China Gold	Napa	21,725	6,534	847	3.32
Yuki	Napa	20,108	6,443	817	3.12
Minuet	Napa	18,662	5,536	1,210	3.43
Bilko	Napa	18,170	6,262	968	2.91
Spring Flavor	Napa	16,250	5,354	1,210	3.11
Joi Choi	Bok Choi	19,944	6,171	1,089	3.17
Mei Qing Choi	Bok Choi	10,099	4,538	2,450	2.11
R^2		***0.40***	***0.60***	***0.41***	***0.62***
CV		***17***	***19***	***63***	***17***
LSD		***1,483***	***5,178***	***1,154***	***0.08***

More Chinese Cabbage Varieties Tried in Central Alabama, 2010

Joe Kemble, Edgar Vinson, and Jason Burkett

A Chinese cabbage variety trial was conducted at E.V. Smith Research Center (EVSRC) in Shorter, Alabama (Tables 1 and 2). Six-week-old, Napa varieties were transplanted onto plots that were 20 feet long on 6 foot centers on September 28. Plants within a row were spaced at 1.5 feet. White plastic mulch and drip irrigation were used.

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory. For current recommendations for pest and weed control in vegetable production in Alabama, consult your county extension agent online at www.aces.edu/counties.

Napa varieties were harvested on November 30 and heads were weighed in the field (Table 3). 'Rubicon' produced the highest marketable yield. Yield of 'Rubicon' was statistically similar to 'Spring Flavor', 'Yuki', and 'China Star'. Marketable yield of 'Rubicon' was statistically higher than 'China Gold' and 'Minuet'. 'China Gold' and 'Minuet' also produced smaller individual heads though there were no differences found in this category among varieties.

TABLE 1. RATINGS OF THE 2010 CHINESE VARIETY TRIAL[1]

Location	EVSRC
Weather	5
Fertility	5
Irrigation	5
Pests	5
Overall	5

[1] See introduction for description of ratings scales.

TABLE 2. TYPE, SEED SOURCE, AND DISEASE CLAIMS OF SELECTED CHINESE CABBAGE VARIETIES

Variety	Type	Seed source	Plant habit	Disease claims[1]	Color	Days to harvest
China Gold	Napa	Sakata	Upright	CR, TB	G	65
China Star	Napa	Sakata	Upright	BLSp,TB	G	69
Minuet	Napa	Johnny's Select	Upright	BLSp, BR, DM	G,Y	48
Rubicon	Napa	Johnny's Select	Upright	Bl	G,Y	52
Spring Flavor	Napa	Seminis/Siegers	Upright	DM	G	68
Yuki	Napa	Sakata/Siegers	Upright	CR	G	67

[1] Disease Claims: BR=Bottom rot; BLSp = Black spot; Bl=bolt tolerant; CR=Club root; DM = Downey Mildew; TB =Tip burn.

TABLE 3. YIELD OF SELECTED CHINESE CABBAGE VARIETIES

Variety	Marketable yield *lb/A*	Individual fruit weight *lb*
Rubicon	24,826	1.94
Spring Flavor	24,418	1.91
Yuki	23,992	1.88
China Star	23,732	1.86
China Gold	21,357	1.67
Minuet	21,339	1.67
R^2	***33***	***33***
CV	***9***	***9***
LSD	***3,430***	***0.60***

Results of the 2008 National Sweetpotato Collaborators' Trial

Joe Kemble, Edgar Vinson, and Arnold Caylot

National Sweetpotato Collaborators' trials were conducted at the North Alabama Horticulture Research Center (NAHRC) in Cullman, Alabama (Table 1.).

Sweetpotato roots from selected commercial varieties and breeding lines were planted in a heated bed at NAHRC on March 26 for slip production. Slips of two sweetpotato lines were planted on July 3. Varieties were replicated four times. Plots contained two rows that were 40 feet long and 3.5 feet wide. Within-row spacing was 1 foot.

Soils were fertilized according to the recommendations of the Auburn University Soil Testing Laboratory and consisted of (per acre) 80 pounds N, 184 pounds P_2O_5 and 156 pounds K_2O total. For current recommendations for pest and weed control in vegetable production in Alabama, consult your county extension agent or go online to www.aces.edu/counties.

Sweetpotatoes were harvested on October 2. Roots were graded as US No. 1 (roots 2 to 3.5 inches in diameter, 3 to 9 inches in length, well shaped, and free of defects), canner (roots 1 to 2 inches in diameter, 2 to 7 inches in length), jumbo (roots that exceed the diameter, length, and weight requirements of the US No. 1 grade, but that are of marketable quality), or cull (roots at least 1 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 No. 1, canner, and jumbo grades. Percent US No. 1 was calculated by dividing the yield of the US No. 1 grade by the marketable yield (Table 2).

TABLE 1. RATINGS OF THE 2008 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 2. YIELD [1] AND GRADE DISTRIBUTION OF OF SELECTED SWEETPOTATO BREEDING LINES AND CULTIVARS

Variety	Total marketable yield	U.S. No. 1	Canner	Jumbo	U.S. No, 1	Culls
	50 lb. bu/A				*%*	*50 lb. bu/A*
Beauregruard (B94-14 G2)	475	340	120	15	72	67
Evangaline	415	295	96	24	71	28
Covington	395	305	63	28	76	28
NC99-573*	366	268	81	18	74	40
Beauregard** (B63 G1 LSU)	305	190	73	42	63	76
NC Japanese	270	199	61	9	73	43
Murasaki-29	128	39	89	0	30	63
R^2	***0.84***	***0.85***	***0.50***	***0.42***	***0.81***	***0.50***
CV	***14***	***21***	***31***	***102***	***14***	***49***
LSD	***107***	***92***	***48***	***37***	***13***	***45***

[1] Averages yields are given on a per acre basis.
* = breeding lines;
** = Modified versions of 'Beauregard'

Improving Sustainability in Peach Production, 2009

Elina Coneva, Edgar Vinson, and Jim Pitts

As part of the cooperative regional project NC-140, a peach rootstock trial that compares 18 rootstocks at 14 locations in 12 states was planted in 2009. The main project objective is to evaluate the influence of various rootstocks on peach tree characteristics grown under different management systems and environmental conditions, and to study the genetics and developmental physiology of rootstock/scion interactions in peach trees.

An experimental plot consisting of 14 peach rootstocks—'Guardian' and 'Lovell' (standards), 'Viking', 'Atlas', BH-5 (Bacterial canker resistant), Krymsk 86 (wet feet tolerant), 'Mirobac', KV010123, KV010127 (USDA breeding program), 'Empyrean 2', HBOK 10, HBOK 32, 'Krymsk 1', 'Controller 5' (size controlling rootstocks)—was planted in February 2009 at the Chilton Research and Extension Center near Clanton, Alabama, with 'Redhaven' as a scion cultivar. Experimental design was a completely randomized block with eight single-tree replications. Data on peach tree vegetative plant growth, including trunk circumference, number of suckers per trunk, and survivability were collected.

One tree grafted on HBOK 32 did not survive its first season, which resulted in 88 percent survivability rate in 2009 (Table 1). Trees grafted on 'Guardian' and KV010127 were found to have the highest number of suckers in their first growing season (0.1 suckers on average).

Trees on 'Mirobac', 'Guardian', and 'Viking' were the most vigorously growing in 2009, based on their trunk cross sectional area (TCSA) (Table 1). Trees on 'Mirobac' were 116 percent the size of trees on 'Guardian' and 140 percent the size of trees on 'Lovell'. During the first growing season, HBOK 10 and HBOK 32 demonstrated the least tree vigor of 2.7 and 3.2 cm^2 TCSA, respectively, and trees grafted on them were 14.6 percent to 17.3 percent the size of trees on 'Guardian' rootstock.

FIRST YEAR PERFORMANCE OF 'REDHAVEN' PEACH ON 14 ROOTSTOCKS, 2009

Rootstock cultivar	Survival *%*	TCSA, *cm^2*	Suckers *no*
Viking	100 a	18.3 ab	0.0 a
Atlas	100 a	14.8 bc	0.0 a
BH-5	100 a	15.1bc	0.0 a
Mirobac	100 a	22.0 a	0.0 a
Guardian®	100 a	18.5 ab	0.1 a
Lovell	100 a	13.2 cd	0.0 a
KVO10123	100 a	8.9 e	0.0 a
KVO10127	100 a	10.6 de	0.1 a
Krymsk® 86 (Rugan 86)	100 a	11.9 cde	0.0 a
Empyrean® 2 (Penta)	100 a	13.9 cd	0.0 a
HBOK 10	100 a	2.7 f	0.0 a
HBOK 32	88 b	3.2 f	0.0 a
Krymsk® 1 (WA-1)	100 a	11.6 cde	0.0 a
Controller 5 (K146-43)	100 a	9.8 de	0.0 a

Values within a column that have any letter in common are not significantly different.

Evaluation of Muscadine Grape Varieties, 2008

Elina Coneva, Bryan Wilkins, Edgar Vinson, Jim Pitts, and Jason Burkett

Twenty-six muscadine grape cultivars are being evaluated at two locations in Central Alabama: E. V. Smith Research Center (EVSRC) in Shorter and Chilton Research and Extension Center (CREC) in Clanton.

At both sites, fresh market and processing grapes were included in the study, and vines were trained to a Geneva Double Curtain trellis system and spaced at 20 by 12 feet.

Among the muscadine cultivars grown at EVSRC, 'Pam' had the highest yield, an average of 370 pounds of fruit per vine in 2008 (Table 1). This translates to 67,340 pounds per acre at 20 by 12 feet vine spacing. 'Janet', 'Ison', 'Early Fry', and 'Noble' also produced high yields of more than 100 pounds per vine (more than 18,200 pounds per acre). 'African Queen' muscadine had the lowest yield of 39 pounds per vine. 'Darlene' vines produced the largest berries, 0.6 ounce on average (see Table 1), followed by 'Early Fry', 'Pam', 'Black Beauty', and 'Janet'. 'African Queen' and 'Early Fry' muscadines had the sweetest berries with 17.9 percent soluble solids. 'Black Beauty' and 'Black Fry' also had soluble solids content of more than 17 percent. Based on the pruning weights, 'Darlene' was the most vigorously growing muscadine cultivar with an average of 52 pounds pruned wood per vine during the dormant season. 'Black Beauty', 'Janet', 'Pam', and 'Black Fry' had medium to high vigor, while 'Early Fry' had the lowest vigor in 2008.

'Loomis' produced the highest yield of 356 pounds per vine among the cultivars studied at CREC (Table 2). 'Fry' and 'Granny Val' were also heavy croppers that produced 319 and 226 pounds per plant, respectively. Cultivars 'Dixie', 'Cowart', 'Triumph', 'Black Beauty', 'Ison', 'Sugar Pop', 'Summit', 'Jumbo', 'Top Sail', and 'Precious' also had high yield. 'Black Beauty' and 'Florida Fry' had the largest berries of 0.5 ounce on average, while 'Dixie' had the smallest berry size of 0.1 ounce. 'Top Sail' and 'Loomis' had a high soluble solids content of 17.3 and 16.0 percent respectively.

When the overall performance of the cultivars 'Ison', 'Black Beauty', 'Early Fry', 'Black Fry', and 'Darlene' (grown at both experimental sites) is compared, considerable differences in muscadine cultivar response to the growing location were observed. In terms of cropping potential, cultivars grown at the CREC were, in general, more productive when compared to the same cultivars grown at EVSRC, with the exception of 'Early Fry', which had greater crop load at the EVSRC. The mean berry size in four of the above mentioned cultivars was generally larger for the cultivars grown at EVSRC (except 'Black Beauty', having 0.5 ounces berries at both locations). Cultivars grown at both locations differed considerably in their period of maturity. Crop of the 'Early Fry', 'Black Fry' and 'Ison' was harvested between August 4 and August 19 at the EVSRC, while the harvest period for

TABLE 1. PERFORMANCE OF SELECT MUSCADINE GRAPE CULTIVARS GROWN AT THE E.V. SMITH RESEARCH CENTER, 2008

Cultivar	Yield	Mean berry size	Soluble solids	Season of ripening[1]	Pruned wood weight
	lb/plant	*oz*	*%*		*lb/vine*
Pam	370	0.4	15.7	Aug 10	19
Black Fry	72	0.5	17.4	Aug 19	18
Ison	123	0.4	15.6	Aug 10	12
Early Fry	109	0.3	17.9	Aug 4	7
Noble	103	0.5	16.8	Aug 26	15
Darlene	79	0.1	15.9	Aug 10	52
Black Beauty	56	0.6	17.6	Aug 19	27
Janet	237	0.5	16.0	Aug 10	26
African Queen	39	0.5	17.9	Aug 19	12

[1] Season of ripening was based on 50 percent mature fruit.

the same cultivars was about 3 weeks later at the CREC. Harvest time for 'Black Beauty' and 'Darlene' grown at the CREC occurred about 4 weeks after the same cultivars were harvested at the EVSRC.

TABLE 2. PERFORMANCE OF SELECTED MUSCADINE GRAPE CULTIVARS GROWN AT THE CHILTON RESEARCH AND EXTENSION CENTER, 2008

Cultivar	Yield	Mean berry size	Soluble solids	Season of ripening[1]
	lb/plant	*oz*	*%*	
Darlene	143	0.3	15.1	Sept 11
Triumph	162	0.3	13.8	Sept 2
Loomis	356	0.3	16.0	Oct 1
Cowart	188	0.2	13.0	Sept 6
Jumbo	139	0.3	14.2	Sept 11
Fry	319	0.3	14.0	Sept 11
Higgins	109	0.3	14.0	Sept 11
Summit	140	0.3	15.0	Sept 11
Dixie	190	0.1	13.2	Sept 6
Sugargate	36	0.4	15.1	Aug 29
Watergate	97	0.2	12.7	Aug 29
Black Fry	95	0.3	12.0	Sept 11
Ison	149	0.2	10.0	Aug 29
Farrer	94	0.4	15.0	Sept 2
Black Beauty	159	0.5	15.2	Sept 11
Sugar Pop	146	0.3	14.2	Sept 17
Granny Val	226	0.2	14.0	Aug 29
Top Sail	126	0.2	17.3	Sept 11
Early Fry	42	0.4	14.5	Aug 21
Precious	124	0.3	11.5	Aug 29
Late Fry	110	0.4	13.6	Sept 11
Florida Fry	43	0.5	13.0	Sept 18

Evaluation of muscadine grape cultivars in various locations in Alabama is ongoing. Further research is needed to assess the best suited muscadine cultivars for commercial production in a range of diverse growing conditions.

Evaluation of Rabbiteye Blueberry Cultivars in Alabama

Elina Coneva, Jeff Sibley, and Arnold Caylor

Blueberries are a specialty crop of significant interest worldwide. In the last decade production has doubled and acres of blueberries planted has increased rapidly. North America is the world's leading blueberry producer, accounting for nearly 90 percent of world production at the present time. Blueberry production in Alabama is a small, but growing industry.

A study to evaluate the performance of selected well-established and newly released rabbiteye blueberry cultivars in Alabama's environment was initiated in 2006. Twelve rabbiteye blueberry cultivars including 'Alapaha', 'Baldwin', 'Brightwell', 'Climax', 'Ira', 'Montgomery', 'Tifblue', 'Ochlockonee', 'Onslow', 'Premier', 'Powder Blue', and 'Yadkin' were planted at the North Alabama Horticulture Research Center in Cullman. Three year old rooted blueberry cuttings, grown in 3 gallon pots until fall planting were used to establish the experimental plot.

In 2008, the fruit of 'Alapaha', 'Climax', 'Montgomery', and 'Premier' started ripening early in the season, on June 17, when the first harvest occurred. 'Baldwin', 'Brightwell', 'Power Blue', 'Tifblue', and 'Ochlockonee' had their first mature berries on June 25. The first harvest for cultivars 'Onslow', 'Yadkin' and 'Ira' was recorded late in the season, on July 1st. Blueberry cultivars were harvested each week with the last harvest picked on July 29.

'Alapaha' blueberry produced the highest yield, 8.6 pounds per bush (Table 1). 'Tifblue', 'Yadkin', 'Ira', and 'Onslow' rabbiteye blueberries produced an average yield of 6.6, 6.4, 6.3, and 6.2 pounds per plant, respectively. 'Ochlockonee' had the lowest harvest recorded when compared to other cultivars in our study.

'Baldwin', 'Premier', and 'Tifblue' had the largest berries with an average berry weight of 0.06 ounce, followed by 'Alapaha', 'Climax', 'Onslow', and 'Yadkin' with mean berry weight of 0.05 ounce. 'Brightwell' and 'Montgomery' had the smallest berries among the blueberry cultivars tested.

'Alapaha', 'Brightwell', and 'Montgomery' had the sweetest berries based on the high percent of the fruit soluble solids—17.7, 17.5, and 17.3 percent, respectively. 'Yadkin', 'Ochlockonee', and 'Climax' also had more than 16.0 percent sugars in their fruit, while the sugar content of 'Tifblue' was 14.5 percent.

When the overall performance among the early ripening varieties is compared to the performance of 'Climax', which is considered as a standard early season cultivar, 'Alapaha' surpassed the standard in terms of yield production and sugar content. 'Tifblue' was the best-performing mid-to late season cultivar based on the high crop load and large berry size. The three late season cultivars tested in the study —'Onslow', 'Yadkin', and 'Ira'—had similar crop load, fruit size, and soluble solids.

PERFORMANCE OF SELECTED RABBITEYE BLUEBERRY CULTIVARS GROWN AT THE NORTH ALABAMA HORTICULTURE RESEARCH CENTER, 2008

Cultivar	Yield	Mean berry size	Soluble solids
	lb/plant	*oz*	*%*
Alapaha	8.6	0.05	17.7
Baldwin	4.9	0.06	15.8
Brightwell	4.7	0.04	17.5
Climax	4.7	0.05	16.1
Ira	6.3	0.05	15.2
Montgomery	5.1	0.04	17.3
Tifblue	6.6	0.06	14.5
Ochlockonee	1.7	0.04	16.1
Onslow	6.2	0.05	—
Premier	4.6	0.06	15.5
Powder Blue	5.7	0.04	15.4
Yadkin	6.4	0.05	16.3

Broccoli Variety Trial, 2010

George Boyhan, Dan MacLean, Suzzanne Tate, and Ryan McNeill

Broccoli production in Georgia has grown significantly in the past 5 to 10 years from almost nothing to its current level with slightly more than 1,000 acres planted and a value of more than $8 million. About half the production occurs in the fall and half in the spring.

Broccoli has rather specific requirements for good production. It requires cool temperatures for proper head development but is not particularly cold tolerant compared to other brassicas. It is also sensitive to high temperatures particularly when high temperatures occur during seed germination.

A study at the Durham Horticulture Farm in Watkinsville, Georgia, was undertaken to evaluate several commercially available broccoli varieties for their performance in north Georgia (Table 1). This study was supported in part by a grant from the Georgia Commodity Commission and participating seed companies.

MATERIALS AND METHODS

Broccoli seed were sown in the greenhouse on August 17 in a standard seed starting media. Greenhouse grown transplants were transplanted on October 12 after hardening off. These seedlings were transplanted onto black plastic covered beds, which were formed on 6-foot centers. The plastic covered beds were approximately 30 to 36 inches across. Two rows, approximately 24 inches apart on the bed, were planted with 18-inch in-row spacing. Plot size was 20 feet long with a 5-foot, in-row alley between each plot. Plots were arranged in a randomized complete block design with three replications.

TABLE 1. BROCCOLI VARIETY TRIAL CONDITIONS[1]

Location	Durham Horticulture Farm
Weather	2
Fertility	5
Irrigation	5
Pests	5
Overall	3

[1] See introduction for description of ratings scales.
Soil type at the Georgia location: water holding capaticty (in/in) = 0.33-0.35; Soil type = Cecil sandy loam.

Plants were fertigated with a liquid fertilizer and treated with Coragen insecticide through the drip irrigation system according to University of Georgia Cooperative Extension Service recommendations and label directions.

Broccoli was harvested on February 9 and 23, 2011. In addition, data were collected on mortality, stand, floret weight, and head diameter during the early yield. Data were analyzed with analysis of variance and Fisher's protected Least Significant Difference (LSD) at the 5 percent level, and the coefficient of variation (CV) was calculated.

RESULTS AND DISCUSSION

Early yields ranged from 0 to 881 pounds per acre (Table 2). The highest early-yielding variety was 'Major', which differed from 'Packman' with 612 pounds per acre. Total yield, which included both harvests, ranged from 125 to 2,326 pounds per acre with 'Monaco' having the highest yield. Although there were significant differences between these varieties, overall yields in this trial were dramatically lower than what a grower should expect in commercial production. Average yields in Georgia are more than 10,000 pounds per acre.

There were significant problems with the trial. Initially the trial was planted for the spring of 2010; however, due to weed pressure and caterpillar damage, the trial was abandoned. Seed were first sown on July 21 to redo the trial, but it proved too hot and germination was very poor. We then covered the bench area with shade cloth and re-sowed seed on August 17. This proved satisfactory and we were able to transplant on October 12, which turned out to be late. The cool fall weather proved ideal for growth initially, but plants did not reach maturity before severe cold weather set in. We had several episodes over the next few months of below freezing temperatures. All the plants showed some freeze damage, but there were relatively few that were killed outright. The highest mortality rate was 24 percent with 'General'.

The initial harvest on February 9, 2011 was low and we thought this would be the only harvest. A warm spell in mid-February, however, resulted in significant growth with many florets finally maturing. A second harvest was much more successful on February 23.

Broccoli requires rather specific conditions to mature properly. This includes an extended period of cool temperatures during growth, but broccoli is not as cold hardy as cabbage or collards, so freezing temperatures can cause severe damage. High temperatures can also be detrimental to broccoli, causing premature flowering or poor germination as we experienced. Because of these specific requirements, northern Maine is an important broccoli-producing region in the eastern United States. In addition, to the problems I've mentioned with this trial, we also had severe boron deficiency in many of the heads as exhibited by hollow stems.

In conclusion, the results from this trial are not reflective of the potential for broccoli in Georgia. This trial does, however, give some insight into variety tolerance to freeze injury and mortality.

TABLE 2. BROCCOLI VARIETY TRIAL, 2010-2011

Variety	Seed source	Early yield *lb/A*	Total yield *lb/A*	Florets *g/5 florets*	Head diameter *in*	Mortality *%*
TBR-499	American Takii	69	1,427	159	1.4	14%
HSX-300XB	Hortag Seed	0	1,785	—	—	1%
HSX-321XB	Hortag Seed	28	834	—	1.9	9%
HSX-220XB	Hortag Seed	0	125	—	—	23%
BI-10	Reed's Seed	0	208	—	—	3%
Premium Crop	Harris Seed	237	1,084	186	2.1	17%
Packman	Harris Seed	612	1,237	289	2.7	22%
Major	Seminis	881	1,451	422	3.0	9%
Ironman	Seminis	403	2,041	304	2.3	5%
Castle Dome	Seminis	698	1,361	304	2.5	4%
General	Seminis	603	1,347	245	2.3	24%
Tradition	Seminis	74	1,427	204	1.9	12%
Captain	Seminis	324	1,429	195	2.2	17%
Monaco	Rogers/Syngenta	52	2,326	195	1.7	8%
Everest	Rogers/Syngenta	681	964	345	2.8	27%
Sarasota	Syngenta	0	952	—	—	13%
Bay Meadows Cemes	Syngenta	85	1,572	222	1.9	6%
CV		***57%***	***37%***	***21%***	***11%***	***74%***
LSD (P ≤ 0.05)		***265***	***805***	***102***	***0.45***	***15%***

— = data missing

Cabbage Variety Trial, 2010

George Boyhan, Dan MacLean, Suzzanne Tate, and Ryan McNeill

Cabbage is an important crop in Georgia with a farm gate value of $37.6 million. Cabbage ranks seventh in vegetable farm gate revenue and fifth in acreage in Georgia. About 6 percent of the crop is grown on plastic and about 15 percent of the crop is grown for processing. The crop is produced both in the spring and fall with production equally split between these seasons.

A study was undertaken at the Durham Horticulture Farm in Watkinsville, Georgia, to evaluate cabbage varieties' performance in north Georgia during winter production.

MATERIALS AND METHODS

Cabbage seed were sown in the greenhouse in a standard greenhouse mix on August 4, 2010. Seven-week-old seedlings were transplanted on September 21. Plants were grown on black plastic, which was laid with a 6-foot center-to-center spacing. Two rows approximately 24 inches apart on the bed were planted with 18-inch in-row spacing. Plots were 30 feet long with 42 plants in each plot. Plots were arranged in a randomized complete block design with three replications. There was a 5-foot, in-row alley between each plot.

Plants were fertigated with a liquid fertilizer and treated with Coragen insecticide through the drip irrigation system according to University of Georgia Cooperative Extension Service recommendations and label directions.

Plants were harvested when judged mature for the specific variety. Harvests occurred on November 22 and on January 4, 5, 7, 19, and 24. Total yield represented all untrimmed plants. Trimmed yield was the yield of just the head with all loose-leaf material removed. These values were converted to yield on a per acre basis.

Three representative heads were measured and averaged to determine core length, which measured the firm core of each. Head firmness was measured on a 1 to 5 scale with 1 indicating a very tight head and 5 indicating a loose head. The head color was noted, but was not characterized otherwise. The head shape was noted and indicated as 1 = Wakefield or pointed; 2 = Copenhagen, Danish ballhead or round; and 3 = flat Dutch.

All heads from a plot were harvested on the same day and the date was noted. Data were analyzed with analysis of variance and Fisher's protected Least Significant Difference (LSD) at the 5 percent level, and the coefficient of variation (CV) was calculated.

TABLE 1. CABBAGE VARIETY TRIAL CONDITIONS[1]

Location	Durham Horticulture Farm
Weather	3
Fertility	5
Irrigation	5
Pests	5
Overall	4

[1] See introduction for description of ratings scales.
Soil type at the Georgia location: water holding capaticty (in/in) = 0.33-0.35; Soil type = Cecil sandy loam.

RESULTS AND DISCUSSION

'Jade Pagoda' had the highest total yield at 52,635 pounds per acre, which was significantly higher than all other varieties. The next highest yielding entry was 'SuperStar' with 37,470 pounds per acre. 'SuperStar' had significantly higher yield than 'Capture' at 25,692 pounds per acre (Table 2).

Trimmed yield ranged from 1,210 pounds per acre for 'Red Dynasty' to 33,194 pounds per acre for 'Jade Pagoda'. Entries with very low trimmed yield indicated that these varieties did not head up very well and remained loose. In addition, we may have been a bit aggressive with trimming the heads; we were trying to mimic the heads available in grocery stores.

Head firmness and core length were somewhat correlated. If an entry had low head firmness, it usually had a smaller core length. This was not the case with 'Jade Pagoda', but as a Chinese cabbage its growth is quite different from the other entries.

There was considerable difference between the harvest dates of the entries. 'Capture' and 'Quisor' were the earliest harvested entries, harvested on November 22. They were noticeably earlier than the other entries. The next group of entries harvested on January 4 to 5 probably could have been harvested somewhat earlier; however, the University is closed over the Christmas holiday and many employees like to take time off at this time of year. Late harvested entries generally

had looser heads as we were giving them as much time as possible to develop, but in some cases they did not head up very well.

This trial was originally planted in the spring on bareground; however, we had problems controlling both weeds and caterpillars to the point that the trial had to be abandoned. We started seedlings in the greenhouse late because of poor germination due to high temperatures. We finally grew a successful crop of seedlings with additional shade in the greenhouse. This, however, resulted in transplanting very late (September 21). The crop did reasonably well after this with some freeze injury during the winter. We would not recommend starting cabbage this late in north Georgia, but for growers who may have similar problems may wish to consider it. This winter was particularly cold and may not be reflective of usual winter conditions.

In conclusion, among the brassicas, cabbage is an excellent choice for fall production. It has much better cold hardiness than others in this group such as broccoli and cauliflower.

TABLE 2. EVALUATION OF CABBAGE VARIETIES, 2010

Variety	Company	Total yield *lb/A*	Trimmed yield *lb/A*	Core length *in*	Head tightness[1]	Color *%*	Head shape[2]	Harvest date
Celebrate	American Takii	31,016	6,332	4.5	1.0	Green	2	1/19/11
Ruby Ball Impr.	American Takii	19,925	4,880	4.3	1.7	Red	2	1/19/11
HSX-3341	Hortag Seed	27,749	18,876	5.8	1.0	Green	2	11/22/10
Cheers	Reed's Seeds	12,140	4,396	6.3	1.3	Green	2	1/7/11
Thunderhead	Reed's Seeds	15,085	5,284	4.7	1.0	Green	2	1/19/11
Checkmate	Bejo Seed	25,692	15,367	4.9	2.3	Green	2	11/22/10
Benelli	Bejo Seed	36,744	16,496	5.1	1.7	Green	3	1/19/11
Capture	Bejo Seed	25,692	6,736	4.6	4.7	Green	2	1/5/11
Ramada	Bejo Seed	28,274	10,204	5.2	3.0	Green	3	1/4/11
Super Red 80	Harris Seed	21,094	2,823	3.5	3.0	Red	2	1/24/11
Bravo	Harris Seed	35,251	11,495	4.8	1.0	Green	2	1/19/11
Jade Pagoda	Harris Seed	52,635	33,194	13.2	3.0	Light green	1	11/22/10
Red Dynasty	Seminis	20,893	1,210	3.6	5.0	Red	2	1/24/11
Platinum Dynasty	Seminis	33,154	17,706	5.8	1.0	Green	2	1/5/11
SuperStar	Sakata	37,470	11,777	5.4	3.7	Green	2	1/5/11
Grand Vantage	Sakata	36,058	13,915	5.3	2.0	Green	2	1/5/11
Quisor	Rogers/Syngenta	31,420	8,268	5.0	2.7	Green	2	1/7/11
CV		***24%***	***36%***					
LSD (P ≤ 0.05)		***11,712***	***6,591***					

[1] Head tightness: 1-5, 1-tight, 5-loose

[2] Headshape: 1 = Wakefield or pointed, 2 = Copenhagen, Danish ballhead or round, 3 = Flat Dutch

Sweet Corn Variety Trial, 2010

George Boyhan, Dan MacLean, Suzzanne Tate, and Ryan McNeill

Sweet corn acres planted in Georgia have varied considerably during the past 10 years, reaching a high in 2004 with more than 28,000 acres. In 2009 sweet corn acres had dropped to approximately 21,500 acres, which placed it second in vegetable acres just behind watermelon. The overall value of the crop is more than $80 million and ranks fourth among vegetables produced in the state.

The objective of this study was to evaluate several sweet corn varieties for suitability in production in north Georgia.

MATERIALS AND METHODS

The sweet corn variety trial was conducted at the Durham Horticulture Farm in Watkinsville, Georgia. All 17 of the sweet corn entries in the trial were supersweet types pocessing the sh2 gene.

Seed were direct sown on June 23, 2010, using an Earthway Seeder with the sweet corn seed plate. Three rows of corn were planted in each plot with a between-row spacing of 30 inches. The plots were 25 feet long.

The experiment was arranged as a randomized complete block design with four replications. Sweet corn were harvested on August 24, 25, and 31 and September 1 as varieties were judged mature.

TABLE 1. SWEET CORN VARIETY TRIAL CONDITIONS[1]

Location	Durham Horticulure Farm
Weather	5
Fertility	5
Irrigation	5
Pests	4
Overall	4

[1] See introduction for description of ratings scales.
Soil type at the Georgia location: water holding capaticty (in/in) = 0.33-0.35; Soil type = Cecil sandy loam.

Data collected included plant height based on the average of three measurements in each plot. In addition, total yield, ear diameter, ear length, number of kernel rows, and tip fill data were collected. All data were subjected to analysis of variance and Fisher's Protected Least Significant Difference (LSD) at the 5 percent probability level., and the coefficient of variation (CV) was calculated.

RESULTS AND DISCUSSION

Yields ranged from 50 to 283 cartons per acre with the greatest yield from WH0809, a genetically modified organism (GMO) variety from Rogers Seed. This variety had signifcantly greater yield than 'Passion', which had 187 cartons per acre.

Three of the entries were GMO varieties: GH0851, BC 0805, and WH0809. These entries all showed markedly less worm damage, if not better yields, than other varieties. GMO squash has made significant in-roads into the market, whereas GMO sweet corn varieties have not. The seed company restricts access to a certain extent by requiring a minimum purchase (≈$1,000) of seed that is, as would be expected, priced higher than conventional F1 varieties.

Sweet corn varieties are generally shorter than field corn varieties. All the entries in this trial would, in general, be shorter than field corn, but they did range from 43 to 78 inches in height. The ultra short varieties were barely more than 3 feet, while taller varieties were 5 feet or taller.

Ear diameter, length, and number of kernal rows differed significantly between the entries. These differences can be of concern based on the market. Growers may wish to talk to their potential buyers about the type of ear they would desire. In addition, there are three basic colors available: yellow, white, and bicolor (white and yellow). In conclusion this trial went very well, but would be improved with precision seeding equipment.

TABLE 2. SWEET CORN VARIETY TRIAL, 2010

Variety	Company	Plant height *in*	Yield *cartons/A*[1]	Ear diameter *in*	Ear length *in*	Kernal rows *no*	Tip fill [2]	Color
Passion	Seminis	61	187	1.4	7.3	14.9	2.9	Yellow
Obsession	Seminis	64	226	1.3	7.2	14.8	2.8	Bicolor
Sweet Talk	Seminis	78	278	1.4	6.6	16.3	2.8	Yellow
Devotion	Seminis	69	248	1.6	7.0	16.3	3.0	Bicolor
Vision Xtra Tender	Seedway	54	146	1.6	7.0	14.1	2.6	Yellow
1283 Xtra Tender	Seedway	62	282	1.4	7.3	14.8	3.0	Yellow
1575 Xtra Tender	Seedway	43	153	1.5	7.1	13.7	2.5	Yellow
1675 Xtra Tender	Seedway	53	130	1.3	7.6	13.4	2.8	Yellow
Saturn (Cruiser)	Seedway	59	244	1.6	6.8	13.8	2.8	Yellow
170A Xtra Tender	Seedway	51	138	1.6	6.9	12.9	2.6	Yellow
Saturn	Seedway	56	265	1.5	6.4	13.8	2.8	Yellow
GH0851	Rogers/Syngenta	60	121	1.5	7.8	13.8	3.0	Yellow
BC 0805	Rogers/Syngenta	68	209	1.5	8.2	14.3	2.8	Bicolor
Garrison	Rogers/Syngenta	57	95	1.6	6.6	14.4	2.7	Yellow
Legion	Rogers/Syngenta	51	94	1.4	6.5	14.8	2.7	Bicolor
Munition	Rogers/Syngenta	60	50	1.3	6.6	13.6	2.8	Bicolor
WH0809	Rogers/Syngenta	67	283	1.5	8.1	14.1	2.4	White
CV		***11%***	***30%***	***8%***	***6%***	***8%***	17%	
LSD (P ≤ 0.05)		***9***	***80***	***0.2***	***0.6***	***1.7***	NS	

[1] Carton = 42 pounds
[2] Tip fill: 1 = poor, 2 = intermediate, 3 = good

Pepper Variety Trials, 2010

George Boyhan, Dan MacLean, Suzzanne Tate, and Ryan McNeill

Peppers are an important crop in Georgia, accounting for about $138 million in farm gate value. The bulk of this production is with bell peppers, but a significant amount of hot and banana peppers are produced in the state.

There are a number of diseases and insect problems that affect peppers. Seed companies are continuing to develop varieties that in some cases can mitigate these problems. There are more than 60 varieties recommended in the latest version of the Vegetable Crop Handbook for the Southeast with more than half recommended for Georgia.

The purpose of these tests was to evaluate several pepper varieties in both south Georgia, where most pepper varieties are grown, and in north Georgia for growers in that region.

MATERIALS AND METHODS

All transplants were produced at the Durham Horticulture Farm greenhouses in Watkinsville, Georgia. Pepper transplants for the Tifton Vegetable Park planting were sown on April 13, 2010, into a standard greenhouse mix and grown under standard greenhouse conditions. Transplants were transported to the Tifton campus on May 18 and transplanted onto plastic-covered beds on May 19. Additional plants were transplanted on June 11 because of stand loss.

TABLE 1. PEPPER VARIETY TRIAL CONDITIONS[1]

Location	Durham Horticulure Farm	Tifton Vegetable Park
Weather	5	5
Fertility	5	5
Irrigation	5	5
Pests	5	3
Overall	5	3

[1] See introduction for description of ratings scales.
Soil type at the Durham location: water holding capaticty (in/in) = 0.33-0.35; Soil type = Cecil sandy loam.
Soil type at the Tifton location: water holding capaticty (in/in) = 0.15; Soil type = Tifton loamy sand.

Plants were grown according to the University of Georgia's Cooperative Extension Service recommendations for staked plasticulture peppers with under plastic drip irrigation. The plastic color was black.

Fruit was harvested beginning on July 8 with two additional harvests on July 12 and 30. Data collected at the Tifton Vegetable Park included total yield and weight of 10 randomly selected peppers.

Transplants for the Durham Horticulture Farm trial were sown in the greenhouse on June 29. They were grown similarly to the Tifton transplants.

Plants were transplanted to the field on August 26 on plastic-covered beds. The plastic used was white. These plants were grown according to University of Georgia Cooperative Extension Service recommendations for staked plasticulture peppers with under plastic drip irrigation.

Fruit were harvested on September 30, October 8, 14, 26, and November 2 and 8. All bell pepper fruit except for the first harvest were graded into Fancy (greater than or equal to 3 inches), No. 1 (greater than or equal to 2.5 inches) or No. 2 (less than 2 inches). The non-bell pepper types were not graded for size.

Beds were prepared 6 feet on-center and covered with plastic with the plots 20 feet long. Plants were planted in double rows with an 18 inch in-row spacing and 18 inches between rows. There were four replications in the Tifton trial and three replications in the Watkinsville trial arranged as a randomized complete block design. All collected data were subjected to ANOVA and analyzed with Fisher's Protected LSD ($P \leq 0.05$). In addition, the coefficient of variation (CV) was computed.

RESULTS AND DISCUSSION

The Tifton trial overall had lower yields than the Watkinsville trial. We had problems in establishing the stand with many plots losing plants. In addition, weeds became a major problem in the row middles, which competed with the plants for water and nutrients.

The highest yielding bell pepper variety was 'Revolution' with 289 bushels per acre, which was significantly better than 'Aristotle X3R', PS 9928302, 'Tomcat – R', and 'Regiment F1' (Table 2).

The greatest yield overall in the Tifton trial was 'Key Largo' the yellow banana pepper with 388 bushels per acre. 'Key Largo' was also notable for producing fruit a full week before any of the other varieties. It did better than all other varieties except the chile variety J7 and the bell pepper 'Revolution'.

The Watkinsville trial was initially established in the spring on black plastic at approximately the same time as the Tifton trial. Unfortunately, the site selected was a heavy clay that was not suitable for forming plastic beds or establishing transplants. We abandoned this initial planting and started over. We were not too hopeful because fall-planted peppers are not recommended for north Georgia, but we pushed ahead and transplanted again on plastic-mulched beds on August 26.

The second site was much better and we were able to establish a planting without any trouble. We also switched to using white plastic because we thought it would be too hot for the peppers initially. This we believe was unnecessary, but in any case the planting did quite well.

We were surprised at how well the peppers did. They remained largely free of diseases and we treated with Coragen insecticide to avoid late summer and early fall insect problems.

The first harvest on September 30 was very light with few fruit harvested. 'Key Largo', a sweet yellow banana pepper, was notable on this first harvest with the large number of fruit produced.

The highest early yields were with 'Allegiance', a bell pepper from Harris Moran Seed (Table 3). This variety did better than all other bell peppers except 'Revolution' and 'Hunter'. It also outperformed the chile, jalapeño, and yellow banana types for early yield. The highest percent of fancy peppers among the early yield was 'Revolution' with about 8.5 percent.

'Aristotle X3R' had the greatest total yield with 503 bushels per acre. This contrasts with the results in Tifton where 'Aristotle X3R' had the lowest yield. The non-bell peppers all did reasonably well with 379, 470, and 367 bushels per acre for the jalapeño, chile, and the yellow banana, respectively. 'Allegiance', the highest early yielder, had 458 bushels per acre of total yield and did not differ significantly from the highest yielding variety. The percent of total fancy fruit was 5 percent or less for most of the bell pepper varieties.

In conclusion, trial results were interesting with significant differences between the entries. The overall results were somewhat inconclusive as no varieties stood out in both trials. The most surprising finding of the trials was how well peppers performed in north Georgia. This could be a significant new crop for this region of the state, particularly for organic growers.

TABLE 2. PEPPER VARIETY TRIAL, TIFTON VEGETABLE PARK, 2010

Variety	Company	Yield *1 1/9 bu/A*[1]	Fruit weight *oz*	Fruit type
Minero	American Takii	215	0.5	Jalepeno
J7	American Takii	330	0.7	Chile
Revolution	Harris Moran	289	3.4	Bell
Allegiance	Harris Moran	251	3.3	Bell
Vanguard	Harris Moran	210	3.0	Bell
Jupiter	Harris Seed	164	2.5	Bell
Key Largo	Harris Seed	388	1.5	Yellow banana
Plato	Seminis	149	2.5	Bell
PS 09942815	Seminis	213	2.3	Bell
Aristotle X3R	Seminis	54	1.8	Bell
PS 9928302	Seminis	128	3.0	Bell
Hunter	Rogers/Syngenta	148	2.4	Bell
Tomcat - R	Rogers/Syngenta	115	2.0	Bell
Regiment F1	Harris Moran	90	2.3	Bell
CV		***53%***	***22%***	
LSD (P ≤ 0.05)		***151***	***0.7***	

[1] 1 1/9 bushel weighs 28 pounds.

TABLE 3. PEPPER VARIETY TRIAL, DURHAM HORTICULTURE FARM, 2010

Variety	Company	Early yield[1]				Total yield[1]				Fruit type
		Fancy[3]	No.1	No. 2	Total	Fancy	No. 1	No. 2	Total	
		1 1/9 bu/A [4]								
Minero	American Takii	—	—	—	122	—	—	—	379	Jalepeno
J7	American Takii	—	—	—	139	—	—	—	470	Chile
Revolution	Harris Moran	19	111	68	221	25	211	207	466	Bell
Allegiance	Harris Moran	10	138	77	236	10	253	184	458	Bell
Vanguard	Harris Moran	0	65	85	164	3	122	190	330	Bell
Jupiter	Harris Seed	1	51	72	133	2	144	279	435	Bell
Key Largo	Harris Seed	—	—	—	103	—	—	—	367	Yellow banana
Plato	Seminis	5	51	42	99	16	181	257	455	Bell
PS 09942815	Seminis	2	50	57	111	4	133	189	328	Bell
Aristotle X3R	Seminis	9	87	66	176	15	216	258	503	Bell
PS 9928302	Seminis	8	75	40	131	14	198	143	362	Bell
Hunter	Rogers/Syngenta	1	106	54	165	6	230	195	435	Bell
Tomcat - R	Rogers/Syngenta	6	61	79	153	6	179	209	401	Bell
Regiment F1	Harris Moran	2	35	42	84	2	104	185	296	Bell
Intruder	Rogers/Syngenta	8	94	64	174	14	223	247	492	Bell
CV		***48%***	***46%***	**—**	***23%***	**—**	***36%***	0.2	17%	
LSD (P ≤ 0.05)		***NS***	***NS***	***NS***	***58***	***NS***	***NS***	72	119	

[1] Early yield includes harvests on first three harvest dates: 9/30, 10/8, and 10/14
[2] Total yield includes all harvests: 9/30, 10/8, 10/14, 10/26, 11/2, and 11/8
[3] Fancy = ≥3 inches, No 1 = ≥2.5 inches, No 2 = <2.5 inches
[4] 1 1/9 bushel weighs 28 pounds.

Green Bean Variety Trials, 2010

George Boyhan, Dan MacLean, Suzzanne Tate, and Ryan McNeill

Vegetable legume production in Georgia, which includes beans, southernpeas, lima beans, and English peas, tops $55 million annually. More than $35 million of this production is green beans. All vegetable legumes together rank sixth in total vegetable production with green beans alone ranking eighth among vegetables in Georgia.

The purpose of the green bean trials was to evaluate several green bean varieties at the Tifton Vegetable Park in Tifton, Georgia, and at the Durham Horticulture Farm in Watkinsville.

MATERIALS AND METHODS

All bean varieties were direct seeded. In Tifton, the seed were sown on May 19, while seed were sown on June 23 at the Horticulture Farm. Seed were hand sown in Tifton with a 1 to 2 inch in-row spacing with 2 feet between rows. An Earthway seeder with the bean plate was used to sow the seed at the Durham Horticulture Farm in the same row configuration as in Tifton.

Plot size was 20 feet long with a 5 foot in-row alley between each plot. The experiments was arranged as randomized complete block designs with four replications.

Plants were grown according to the University of Georgia's Cooperative Extension Service recommendations for green beans. The beans were drip irrigated at the Tifton site and overhead irrigated at the Watkinsville site as needed.

The beans were harvested and data collected on July 22 to 23 at the Tifton site. The beans were harvested and data collected at the Watkinsville site on September 9 to 13. The harvest consisted of collecting all the beans from a 5-foot section of each plot at both experimental locations. All collected data were subjected to ANOVA and analyzed with Fisher's Protected LSD ($P \leq 0.05$). In addition, the coefficient of variation (CV) was calculated.

RESULTS AND DISCUSSION

There were no differences between the entries at the Tifton site (Table 2). The yield ranged from 398 to 2,381 pounds per acre. There was a considerable amount of variability across the plots; therefore, there were no statistical differences detected. The residual error variance and the relatively high coefficient of variation (33 percent) for green beans indicates the difficulty in detecting true differences.

The bean harvest at the Watkinsville site ranged from 1,670 to 8,697 pounds per acre with 'Terminator' from Abbott & Cobb having the highest yield (Table 3). 'Terminator' yield was significantly better than all varieties except 'Pony Express'. The majority of these varieties clustered together around 5,000 pounds per acre except for the two highest yielding entries as well as 'Crockett' and HMX 7113, both of which had significanly lower yields.

We had poor stand establishment at the Watkinsville site. This, we believe, was due to using the push planter. This was not, however, a major impediment to collecting data since only a 5 ft section of each 20 ft plot was actually harvested.

Varieties at the Watkinsville site were also evaluated for easy of harvest (i.e. how easily the beans could be removed) and degree of curl. Both of these showed no differences between the varieties (data not shown).

Overall these trials could be improved with better precision planters and mechanical harvesting.

TABLE 1. GREEN BEAN VARIETY TRIAL CONDITIONS[1]

Location	Durham Horticulure Farm	Tifton Vegetable Park
Weather	5	5
Fertility	5	5
Irrigation	5	5
Pests	5	5
Overall	4	3

[1] See introduction for description of ratings scales.
Soil type at the Durham location: water holding capaticty (in/in) = 0.33-0.35; Soil type = Cecil sandy loam.
Soil type at the Tifton location: water holding capaticty (in/in) = 0.15; Soil type = Tifton loamy sand.

TABLE 2. GREEN BEAN VARIETY TRIAL, TIFTON VEGETABLE PARK, 2010

Variety	Company	Yield *lb/A*
Caprice	Harris Moran	1,717
Lewis	Harris Moran	1,839
Frontier	Harris Moran	586
HMX 7113	Harris Moran	1,120
HMX 8122	Harris Moran	1,514
Cabot	Harris Moran	2,259
ACR1813	Abbott & Cobb	2,381
Terminator	Abbott & Cobb	1,062
Blue Lake 274	Harris Seed	2,012
Espada	Harris Seed	680
Crockett	Harris Seed	398
Pony Express	Seminis	1,341
Valentino	Seminis	2,026
Bronco	Seminis	2,237
Prevail	Rogers/Syngenta	1,248
Inspiration	Rogers/Syngenta	1,630
CV		***33%***
LSD (P ≤ 0.05)		***NS***

TABLE 2. GREEN BEAN VARIETY TRIAL, DURHAM HORTICULTURE FARM (WATKINSVILLE), 2010

Variety	Company	Yield *lb/A*
Caprice	Harris Moran	5,525
Lewis	Harris Moran	5,641
Frontier	Harris Moran	5,905
HMX 7113	Harris Moran	1,909
HMX 8122	Harris Moran	4,371
Cabot	Harris Moran	6,002
ACR1813	Abbott & Cobb	5,566
Terminator	Abbott & Cobb	8,697
Blue Lake 274	Harris Seed	5,576
Espada	Harris Seed	4,763
Crockett	Harris Seed	1,670
Pony Express	Seminis	7,541
Valentino	Seminis	5,423
Bronco	Seminis	5,474
Prevail	Rogers/Syngenta	4,753
Inspiration	Rogers/Syngenta	4,138
CV		***31%***
LSD (P ≤ 0.05)		***2,257***

Colored Bell Pepper Variety Trial, 2010

Susan Colucci, Chris Gunter, and Michael Hannah

A colored bell pepper variety trial was conducted on a commercial grower's farm located in Haywood County, North Carolina, to determine the marketable yield and quality of commercially available varieties. Eleven varieties were tested including six red, three yellow, one orange, and one chocolate (Table 1).

Six-week-old pepper transplants were set by hand in double rows on May 19. Each plot had 40 plants. Rows were spaced on 5-foot centers and spacing within row was 16 inches. Black plastic mulch was used and beds were irrigated using drip irrigation. Plants were trellised using the Florida weave technique. A randomized complete block design was used with a minimum of two repetitions.

Soils were fertilized according to recommendations of the North Carolina State Extension Service and the 2010 Production Handbook for Commercial Vegetable Growers in the Southeast. For current recommendations for pest and weed control in vegetable production in North Carolina, consult your county Extension agent (see www.ces.ncsu.edu/).

Peppers were hand harvested, counted and graded according to USDA standards on August 18 and 27 and September 7 and 22. Grades for peppers included jumbo (diameter greater than 4 inches), extra large (diameter 3.5 to 3.9 inches), large (diameter 3 to 3.4 inches), medium (less than 3.0 inches diameter), and "chopper" (misshapen fruit). Culls were those pods with visible damage or disease. Pod counts were converted to boxes per acre. Marketable yield was the sum of jumbo, extra-large, large, and medium mean grades across all four harvests (Table 2). Table 2 is sorted by number of jumbo boxes per acre.

Colored bell peppers are not a widely produced commercial crop in western North Carolina but have potential for profitability. There are no standards for yield per acre for colored bell peppers in North Carolina to compare these results.

Though there was not a statistically significant difference in total marketable yield among the varieties, numerically 'Flamingo' (1646.5 boxes per acre) and 'Constitution' (1537.7 boxes per acre) were the red varieties that yielded the most marketable boxes across all grades. These varieties will be tested again in 2011. Among yellow varieties, 'Mecate' yielded greater marketable boxes per acre (1169) numerically compared to 'Gold Crown' (601.5) and 'Satrapho' (591.5).

A fungicide spray program was not adequately established and as a result anthracnose (*Colletotrichum* sp.) was a major contribution to the high number of culls.

TABLE 1. SEED SOURCE AND FRUIT CHARACTERISTICS OF SELECTED COLORED BELL PEPPER VARIETIES

Variety	Seed source	Fruit color	Shape	Glossiness
Alliance	Harris Moran	Green to Red	Blocky	Medium
Chesapeake	Harris Moran	Green to Red	Blocky	Glossy
Constitution	Harris Moran	Green to Medium Dark Red	Blocky	Glossy
Flamingo	Harris Moran	White to Cherry Red	Short, 3-lobe	Glossy
Gold Crown	Sakata	Green to Yellow	Blocky	Medium
Hershey	Siegers	Green to Chocolate Brown	Blocky	Glossy
Karisma	Harris Moran	Green to Medium Dark Red	Blocky	Medium
Mecate	Harris Moran	Green to Yellow	Blocky	Medium
Red Lion	Harris Moran	Green to Dark Red	Rectangular, ½ long	Glossy
Satrapho	Siegers	Green to Yellow	Blocky	Glossy
Tango	Siegers	Green to Orange	Blocky	Medium

TABLE 2. YIELD [1] OF SELECTED COLORED BELL PEPPER VARIETIES, 2010

Variety	Total marketable yield *boxes/A* [2]	Jumbo *boxes/A*	Extra large *boxes/A*	Large *boxes/A*	Medium *boxes/A*	Chopper *boxes/A*	Culls *boxes/A*
Alliance	963.5	582 a[3]	265.5	64.5	52.5 b	83.5	518
Mecate	1169	420 ab	557	122.5	69 b	228.5	324
Karisma[4]	822	304.7 bc	360.7	100.7	56 b	61.3	535
Satrapho	591.5	186 cd	265	78.5	62 b	125	672.5
Constitution[4]	1537.7	146 cd	933	267	191.7 ab	327.7	986.7
Gold Crown	601.5	117 cd	319	79	87 b	103	709.5
Hershey	630.5	81 d	289.5	151.5	108 b	228	571.5
Tango	605	48 d	341	133	83 b	226	365.5
Flamingo	1646.5	36.5 d	837	448.5	324.5 a	109	679.5
Chesapeake	1209.5	6 d	660	340.5	202.5 ab	221	520.5
Red Lion[4]	886.3	4 d	499.3	235.3	148 b	217.7	710
p—value		***0.0018***			***0.0439***		
LSD (P ≤ 0.05)		***223.11***			***151.71***		

[1] Mean of all four harvests.
[2] 1 1/9 bushel boxes per acre. Boxes per acre calculated using the following equation based on 14,934 plants per acre: boxes/A = (pods/plant x 14,934)/box count. Box count: Jumbo 45 pods, Extra—large (Fancy) 55 pods, Large 65 pods, Medium 70 pods, Culls 55 pods.
[3] Letters followed by the same letter are not significantly different.
[4] These varieties were not replicated. All others were replicated twice.

Seed Sources for Alabama Trials, 2010

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

Johnny's Select Seeds
To order: (207) 437-4395
Contact: Steve Woodward
955 Benton Ave
Winslow, ME 04901
Phone: (207) 861-3900
Email: info@johnnyseeds.com

Kelly Seed Company
Contact: Jack Stuckey
420 North Shiloh Road
Hartford, AL 36344
Phone: (334) 588-3821

Sakata Seed America
Contact: Jay Jones
P.O. Box 880
Morgan Hills, CA 95038-0880
Phone: (239) 289-2130

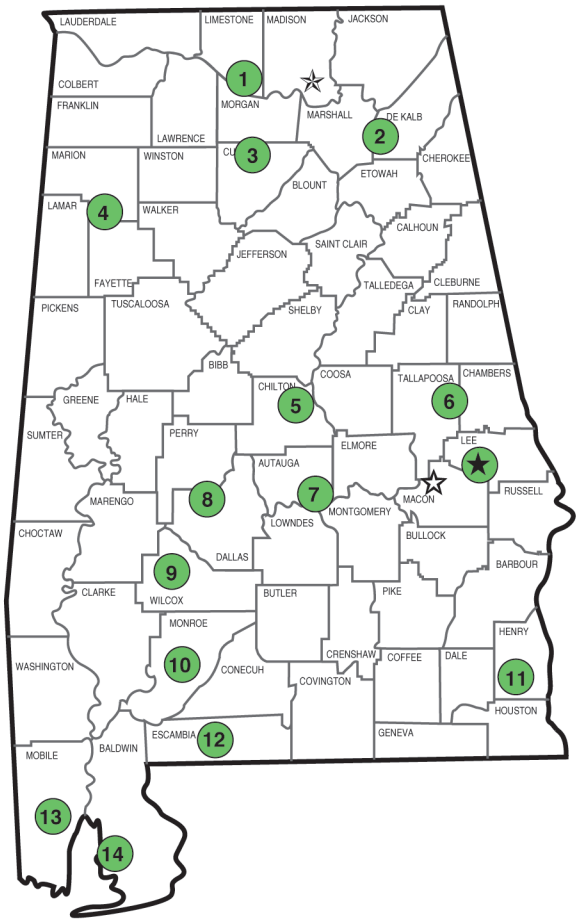
Seminis Vegetable Seed, Inc.
Contact: Rusty Autry
2221 North Park Ave.
Tifton, GA 31796
Phone: (229) 386-0750

Siegers Seed Company
13031 Reflections Drive
Holland, MI 49424
Phone: (800) 962-4999
Fax: (616) 994-0333

Tifton Seed Distribution Center
Contact: Van Lindsey
Phone: (912) 382-1815

Alabama's Agricultural Experiment Station
AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the state has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.
✯ Alabama A&M University.
☆ E. V. Smith Research Center, Shorter.

1. Tennessee Valley Research and Extension Center, Belle Mina.
2. Sand Mountain Research and Extension Center, Crossville.
3. North Alabama Horticulture Research Center, Cullman.
4. Upper Coastal Plain Agricultural Research Center, Winfield.
5. Chilton Research and Extension Center, Clanton.
6. Piedmont Substation, Camp Hill.
7. Prattville Agricultural Research Unit, Prattville.
8. Black Belt Research and Extension Center, Marion Junction.
9. Lower Coastal Plain Substation, Camden.
10. Monroeville Agricultural Research Unit, Monroeville.
11. Wiregrass Research and Extension Center, Headland.
12. Brewton Agricultural Research Unit, Brewton.
13. Ornamental Horticulture Research Center, Spring Hill.
14. Gulf Coast Research and Extension Center, Fairhope.