

## Replicated Asparagus Cultivar Evaluation - 2007-2012

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### ABSTRACT

A replicated cultivar trial of Asparagus (*Asparagus officinalis*) was planted in 2005 to compare the yields of current cultivars to make recommendations to growers. Total yields increased every year by cultivar. Cultivars were numerically ranked each year from the highest to lowest yielding. Data is shown through the 2011 harvest. Cultivars showing the greatest yield stability in the last five years are the two New Jersey male hybrids: Jersey Giant and Jersey Supreme. The California hybrids yields have moved up and down and more time is needed to properly evaluate these. Grande is currently back in 1<sup>st</sup> place for 2011. Yields of Jersey Knight and Purple Passion remained fairly stable, but low. Guelph Millennium yields have steadily increased from 12<sup>th</sup> to 1<sup>st</sup> and 2<sup>nd</sup> place over five years. Yield comparisons will continue over the next eight years to determine the longevity of these cultivars.

### INTRODUCTION

As more people are moving into North Carolina from northern states, where asparagus is commonly grown, they look to buy it from local growers here. It is a high-value horticultural crop that is easy to grow and can bring in extra income for growers.

For over 25 years, new asparagus cultivars are being released as male hybrids. Asparagus is normally **dioecious**, having male and female reproductive structures (flowers) on separate plants. Female plants expend energy to produce seed while in the fern growth stage. Because of this, female plants yield 50-75% less spears than male plants, which produce no seed (5). Seeds from female plants fall to the ground and germinate, causing a seedling asparagus weed problem. For this reason, asparagus breeders in the U.S. and other countries have gone with male hybrids obtained from super male parent plants. The late Dr. Howard Ellison, former asparagus breeder at Rutgers University, observed that although asparagus produces both male and female plants, about one in 500 male plants would produce male flowers and a few flowers with functional male and female parts. By selfing flowers on one of these plants, called "hermaphrodites," Ellison produced his first super male hybrid. When these super males are crossed with a female, the F<sub>1</sub> generation is all male, with no seeds produced. These super male hybrids yield about two to three times the amount of the older dioecious open-pollinated varieties, such as Mary Washington (4).

Other hybrids are obtained by selecting a male and female parent having good characteristics including spear size, spear quality, yield, and disease resistance. These plants are crossed and the resulting hybrids are evaluated for yield, spear quality, and

other essential traits. When two parents that produce good hybrid offspring have been identified, a large number of the male and female parent plants are produced by cloning, in which small pieces of male and female spear tissue are grown separately in tissue culture, which completely regenerates into complete male and female plants that are planted in fields. The root systems or crowns of these plants are dug out of the fields after one year and sold to growers who produce the spears that consumers will buy (7).

Spear toughness or tenderness is determined by the tightness of the spear tip, not by spear diameter. A tight spear tip will cause the spear to be tender while a loose tip will cause the spear to be tough and fibrous. As the spear tip opens up or “ferns out”, fiber development starts in the base of the spear to enable the elongated spear to change into a woody stalk to support the weight of the fern, after the harvest season is over. As temperatures increase over 70 degrees F., spears will fern out at shorter heights, causing the grower to pick shorter spears (sacrificing spear height) in order to harvest tender spears of high quality. Under these conditions, a grower will need to pick at least once a day. Under cool temperatures below 70 degrees, spears will elongate more before ferning out, enabling the grower to harvest taller spears with tight tips that remain tender, with the grower picking once every 2-3 days (3).

### **Trial Cultivar Descriptions**

In this trial, the following asparagus cultivars were grown:

#### **New Jersey Male Hybrids**

**Jersey Giant, Jersey Supreme, Jersey Gem, Jersey Knight and Jersey King** are super male hybrids released from Rutgers University by the work of Drs. Howard Ellison and Stephen Garrison. They were the early pioneers in the discovery of male hybrid asparagus. **Jersey Giant** is a cross between NJ 56 (female) and NJ 22-8 (super male). **Jersey Supreme** is a cross between NJ 44P (female) and NJ 22-8 (super male). **Jersey Gem** is a cross between NJ G27 (female) and NJ 22-8 (super male). **Jersey Knight** is a cross between NJ 277C (female) and NJ 22-8 (super male). **Jersey King** is a cross between MD 10 (female) and NJ 22-8 (super male).

#### **California Hybrids**

The **UC (University of California) 157** cultivar is the progeny of a single cross between a male plant (not a super male) M 120, and a female plant, F 109. Frank Takatori and Frank Southers at the University of California at Riverside developed **UC 157** in 1978.

**UC 115 (DePaoli)** is an asparagus hybrid that is produced by a cross between the female parent clone F600 and the male parent clone M256. The name DePaoli was selected to honor Mr. William DePaoli, Manager of the California Asparagus Commission from its creation in 1990 until his death in 1999. De Paoli is a dioecious hybrid, and is similar to **UC 157** in spear size.

Newer California hybrids include **Atlas**, **Apollo**, and **Grande** that were released by Dr. Brian Benson of California Asparagus Seed and Transplants, Inc. These cultivars all have the female parent of the **UC 157** cultivar and a male parent from the Rutgers University asparagus breeding program. These hybrids are dioecious with female plants producing seed.

**Purple Passion** is a selection from Violeta d' Albinga (cultivar from Albinga, Italy). It is an open-pollinated cultivar with many seeds produced from the female plants. Spear yield is lower than other varieties but spear diameter is very large. It has a burgundy color and is sweeter than green asparagus. When cooked, the purple pigment is destroyed and reverts back to green.

**Dulce Verde** is a cultivar that is higher in sugar content than other green asparagus cultivars. The fern growth on this cultivar was considerably stunted, compared to other cultivars during the 2007 harvest season. Brian Benson decided to discontinue this variety in 2007 and its poor yield caused it to be removed from my trial at the end of 2007.

### **University of Guelph Male Hybrid**

**Guelph Millennium** is a recent male hybrid cultivar release from the University of Guelph in Ontario, Canada by Dr. David Wolyn.

The attributes of the California Hybrids should enable the grower to harvest a taller spear (8-9 inches) at temperatures above 70 degrees F. without the tip of the spear opening up or “ferning out”, which causes spears to be tough. Taller spears are heavier, having more weight per spear. The New Jersey male hybrids, University of Guelph male hybrid, and open-pollinated cultivars fern out at a shorter spear height (5-6 inches) under warm temperatures above 70 degrees F. (3).

The cultivars that were studied in this trial were chosen based on ones that are currently grown for commercial production that are standards in the industry, and ones that may show promise in the future.

## **MATERIALS AND METHODS**

Proper variety selection is important for grower success so a ¼ acre replicated asparagus cultivar trial was planted at the Garnett Carr farm in Roxboro, NC with 13 cultivars. Seeds were sown in the greenhouses of Aarons Creek Greenhouses in Buffalo Junction, VA on January 20, 2005, and 15-week-old seedling transplants were planted into the field on May 4, 2005 in an Appling Sandy Loam soil. A randomized complete block design with 12 plants per plot and 4 replications was used. Transplants were spaced one foot between plants in the row and five feet between rows and planted in the bottom of a 6 inch deep furrow as recommended by Cantaluppi and Motes (2,3,6). As new spears emerged, and as new ferns were formed, the furrows were filled in below the lowest fern branchlets until the furrows were completely filled in at ground level. Since the trial was

planted using seedling transplants, no harvest was taken in 2006. This was done to build food reserves in the crown of the plant to strengthen the plant for a 2-week harvest in 2007.

The transplants were irrigated as needed, during the first growing season only. Irrigation is normally not needed during field establishment and beyond, if establishing a field from crowns (roots) from one-year-old plants in states where the rainfall is 30 inches or more per year (3). However, irrigation is imperative during the establishment year with seedling transplants, since they do not have a one-year-old established root system that can tolerate periods of drought. Irrigation is needed in areas where less than 30 inches of rainfall occur per year. Seeds were used to establish this trial because most of the cultivars were not available as crowns.

The trial was harvested for two weeks, in 2007, four weeks in 2008, six weeks in 2009, and eight weeks in 2010, and will be for eight weeks thereafter for each succeeding year. This harvesting frequency was chosen following research recommendations made by Benson and Motes (1), Motes (6), and Cantaluppi (2) which showed that harvesting asparagus that was established by planting one year old crowns, one year after planting (the second year), caused no reduction in subsequent yield, but provided the grower with an income one year earlier than did harvesting two years after planting. Also, in the second year after planting (the third year), the average spear weight was found to be significantly greater in plants that were harvested the previous year than in plants not harvested the previous year. The increase in spear production may be due to the release of buds from suppression by older shoots (1,2,6).

Asparagus spears can be cut or snapped to produce spears of marketable length, which is usually between 7 and 9 inches, depending on tip tightness. Asparagus spears may be cut below the soil surface with a knife, or they may be hand-snapped above the soil surface. Cutting asparagus requires more labor, but increases yield 20 to 25% because spears are longer. However, cutting spears below the soil greatly increases the chance of the knife injuring a bud or emerging spear on the same crown (3).

When hand-snapping, the spear usually breaks above the area containing fiber. In other words, the portion of the spear left in the field will be fibrous, while the harvested spear is tender and is completely edible. The small stub left above the soil after snapping dries up and disintegrates. A new spear does not come up at that spot, but comes up from another bud that enlarges on another part of the crown. Snapped asparagus has no trim-off waste and should command a higher price than cut asparagus with white butts (3). In this trial, it was decided to snap spears instead of cutting because of the above reasons and is the preferred and accepted method by most growers.

## **RESULTS**

Yield data was recorded in lbs./acre. This was obtained by dividing the total square feet of one plot row (60), into 43,560 (the number of square feet in one acre) to get 726-60 square foot rows in one acre. Data that was recorded included total yield per cultivar, the

yield (and percentage) of spears per cultivar that were greater than 3/8ths inch in diameter, the yield of spears that were less than 3/8ths inch in diameter, and the number of spears per plant that each cultivar produced. Recording yield data in terms of spear diameter (an industry standard), also allows the grower to select a cultivar that would be suitable to him and his customers' preferences. Recording the number of spears produced per plant per cultivar lets the grower compare spear output per cultivar over time. The harvesting frequency was based on how fast the spears grew, based on air temperatures as previously described, resulting in harvested spears that had tight tips, before they started to fern out.

Table 1. Yield in lbs. per acre - 2007

Cultivar	Total Yield <sup>1</sup>	lbs.>3/8" in diam.	lbs.<3/8" in diam.	Spears/plant
UC 157 (F <sub>1</sub> )	1155a	1071a 93%	84 bcd	3.1a
Jersey Giant	944ab	752 b 80%	192a	3.2a
Jersey King	883abc	712 b 81%	171a	2.9a
Jersey Supreme	860abc	722 b 84%	138abc	2.9a
UC 115	821abc	697 b 85%	124abc	2.2abc
Jersey Gem	734 bcd	581 b 79%	153ab	2.6ab
Atlas	717 bcd	684 b 95%	33 de	1.4 cde
Grande	703 bcd	684 b 97%	19 de	1.7 cde
Apollo	555 cd	481 b 87%	74 cde	1.5 cde
Jersey Knight	456 de	414 b 91%	42 de	1.2 def
Purple Passion	151 ef	104 c 69%	47 de	0.6 ef
Guelph Mill.	86 f	42 c 49%	44 de	0.4 f
Dulce Verde	71 f	69 c 97%	2 e	0.2 f

<sup>1</sup> Cultivars with the same letter within columns are not statistically significant, Duncan's Multiple Range Test, .05 level.

### Observations of the 2007 Trial

Harvest started on March 15, 2007, with just a few spears each of Grande, UC 157 and UC 115. A frost occurred on March 19 which delayed future spear emergence until March 26. The other cultivars then started to emerge with the exception of Purple Passion, Dulce Verde, and Guelph Millennium, which did not emerge until April 2. The last harvest was taken on April 5 because on April 6, 7, and 8, severe frosts occurred. A decision was made to end the 2007 harvest at this time, as the harvest period lasted three weeks, with an actual harvest of two weeks for most cultivars, with one week being lost to frost. A total of 10 harvests were made. Guelph Millennium was one of the latest ones to emerge before the second frost occurrence in 2007, and it did not get a chance to fully perform before the harvest was terminated, hence the low yields.

Table 2. Yield in lbs. per acre – 2008

Cultivar	Total Yield <sup>1</sup>	lbs.>3/8”in diam.	Lbs.<3/8”in diam.	Spears/plant
Grande	3030a	2821a 93%	209 e	7.6 bc
Jer. Giant	2737ab	2263ab 82%	474 bc	10.2a
Atlas	2523abc	2298ab 91%	225 e	6.8 cd
Jer. Supreme	2485abc	2064ab 83%	421 bcd	8.7 abc
Jer. King	2458abc	1915 b 78%	543ab	9.3 ab
UC 157 (F <sub>1</sub> )	2385abc	2078ab 87%	307 cde	7.2 bcd
Guelph Mill.	2332abc	1653 b 71%	679a	8.7 abc
UC 115	2314abc	1875 b 81%	439 bcd	7.8 bc
Jer. Gem	2071 bc	1579 b 76%	492 b	7.7 bc
Purple Pass.	1915 bc	1723 b 90%	192 e	4.4 e
Apollo	1781 c	1501 b 84%	280 de	5.4 de
Jer. Knight	1604 c	1401 b 87%	203 e	5.3 de

<sup>1</sup> Cultivars with the same letter within columns are not statistically significant, Duncan's Multiple Range Test, .05 level.

### **Observations of the 2008 Trial**

The drought of 2007 seemed to have no impact on asparagus yields in 2008. When people viewed the trial plots on August 17, 2007, 40 people braved the 104-degree heat to see asparagus ferns standing like a green oasis, which received no water all year, growing in an Appling Sandy Loam soil. This is a great testament for the extreme drought tolerance of asparagus.

In 2008, harvest started on March 22 for most cultivars with the exception of Guelph Millennium. Cool temperatures occurred below 70 degrees until April 11, when yields accelerated, and Guelph Millennium started to emerge. One frost in mid-April set yields back for one week. Then yields increased until it was decided to end the harvest on April 26. The harvest period lasted five weeks, with an actual harvest of four weeks for most cultivars, with a one-week slump in yield, due to frost. A total of 21 harvests were made.

Table 3. Yield in lbs. per acre – 2009

Cultivar	Total Yield <sup>1</sup>	lbs.>3/8”in diam.	lbs.<3/8”in diam.	Spears/plant
Grande	4935a	4293a 87%	642 d	12.8 d
Guelph Mill.	4868ab	2438 b 50%	2430a	19.5a
Jer. Giant	4494abc	3136ab70%	1358 b	16.2ab
Jer. Supreme	4211abc	2948 b 70%	1263 bc	14.9abc
Atlas	3987abc	3316ab83%	671 bcd	10.9 bcd
Jer. King	3937abc	2815 b 72%	1122 bc	13.9 bc
UC 157(F <sub>1</sub> )	3848abc	2962 b 77%	886 bcd	11.7 bcd
Apollo	3550abc	2879 b 81%	671 bcd	10.2 cd
Jer. Gem	3442abc	2386 b 69%	1056 bcd	12.8 bcd
Purple Pass.	3287 bc	2888 b 88%	399 d	7.6 d
Jer. Knight	3233 bc	2476 b 77%	757 bcd	10.8 cd
UC 115	3175 c	2136 b 67%	1039 bcd	10.9 cd

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan’s Multiple Range Test, .05 level.

### Observations of the 2009 Trial

The 2009 harvest went smoothly, with only one light frost on April 6 that brought temperatures down to 31-32 degrees, without a harvest delay after the frost. Harvest started on March 24, with Guelph Millennium (GM) not showing the 20-day delay in emergence compared to other cultivars as it showed in 2008. Instead, two out of four GM replications had spears emerging on March 24, with the other two replications starting four and ten days later, respectively.

The majority of days were cool, with temperatures rarely getting over 85 degrees. So there were no “growth flushes” that would cause a large number of spears to be produced in a short period of time. The harvest period lasted six weeks with a total of 36 harvests.

Table 4. Yield in lbs. per acre – 2010

Cultivar	Total Yield <sup>1</sup>	lbs.>3/8” in diam.	lbs.<3/8” in diam.	Spears/plant
Guelph Mill.	6029a	2931a 49%	3098a	29.2a
Jersey Giant	5304a	3282a 62%	2022 b	23.2ab
Grande	5195a	3933a 76%	1262 bcd	19.3 bc
Jer. Supreme	4759a	2993a 63%	1766 bc	20.7 bc
Atlas	4716a	3799a 81%	917 cd	15.4 bc
UC 157 (F <sub>1</sub> )	4397a	3068a 70%	1329 bcd	17.8 bc
UC 115	4204a	2803a 67%	1401 bcd	16.2 bc
Apollo	4204a	3071a 73%	1133 cd	15.8 bc
Jersey King	3992a	2344a 59%	1648 bcd	17.5 bc
Purple Passion	3884a	3100a 80%	784 d	12.3 c
Jersey Knight	3821a	2665a 70%	1156 bcd	15.2 bc
Jersey Gem	3712a	2187a 59%	1525 bcd	16.3 bc

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan’s Multiple Range Test, .05 level.

### Observations of the 2010 Trial

Harvest started on March 26, with one frost on March 28 that brought temperatures down to 30 degrees and delayed the next harvest for five days. There were no other frosts during the season. Two Guelph Millennium (GM) replications had spears emerging on March 26, and the other two replications had spears emerging seven days later.

There were a few days of cool temperatures, but most were above 70 degrees with very little rainfall. This made the number of “growth flushes” minimal. The harvest period lasted eight weeks with a total of 41 harvests.

Table 5. Yield in lbs. per acre 2011

Cultivar	Total Yield <sup>1</sup>	lbs.>3/8” in diam.	lbs.<3/8” in diam.	Spears/Plant
Grande	6654a	5703a 86%	951 bc	19.6ab
Guelph Mill.	6560ab	3926ab 60%	2634a	28.0a
Jersey Giant	6021ab	4926ab 82%	1095 bc	21.1ab
Jersey Supreme	5696ab	4302ab 76%	1394 bc	30.0ab
Atlas	5630ab	5178a 92%	452 bc	15.4 b
UC 115	5102ab	3951ab 77%	1151 bc	17.2 b
Jersey King	4902ab	3463ab 71%	1439 b	19.0ab
UC 157 (F <sub>1</sub> )	4897ab	3852ab 79%	1045 bc	16.7 b
Purple Passion	4436ab	4049ab 91%	387 c	11.3 b
Jersey Knight	4233ab	3496ab 83%	737 bc	14.6 b
Apollo	4220ab	3546ab 84%	674 bc	13.8 b
Jersey Gem	3770 b	2799 b 74%	971 bc	14.8 b

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan’s Multiple Range Test, .05 level.

## Observations of the 2011 Trial

Harvest started on March 21 with one frost on March 29 that brought the temperature down to 29 degrees and delayed the next harvest for seven days. There were no other frosts during the season. Guelph Millennium spears emerged as follows by each replication: March 21, March 23, March 24, and April 7.

It was a cool growing season with ample rainfall throughout. The harvest period lasted six weeks with a total of 32 harvests. Yields were starting to decline after the 6<sup>th</sup> week, so it was decided to end harvesting at that time rather than to continue to harvest for a full eight weeks and stress the planting, that might lead to yield reductions next year.

The percentage of large diameter spears increased for all cultivars with Guelph Millennium spear diameters increasing from 49% in 2010 to 60% in 2011.

Table 6. Yield in lbs. per acre 2012

Cultivar	Total Yield <sup>1</sup>	lbs.>3/8" in diam	lbs.<3/8" in diam	Spears/Plant
Grande	6621a	5715a 86%	906 cd	20.5abcd
Jersey Supreme	6273ab	4427abc 71%	1846 b	24.5ab
Atlas	5846ab	5249ab 90%	597 d	17.5 bcd
Jersey King	5701ab	4033abcd 71%	1668 bc	22.5abc
Jersey Giant	5390ab	3768abcd 70%	1622 bc	22.3abc
Guelph Mill.	5293ab	2345 d 44%	2948a	27.5a
Purple Passion	5280ab	4732abc 90%	548 d	12.5 d
UC 157 (F <sub>1</sub> )	5278ab	4322abc 82%	956 cd	18.3 bcd
Jersey Knight	5189ab	4234abcd 82%	955 cd	18.8 bcd
Jersey Gem	4575ab	3249 cd 71%	1326 bcd	18.3 bcd
Apollo	4160 b	3321 bcd 80%	839 cd	15.3 cd
UC 115	4154 b	2996 cd 72%	1158 bcd	16.8 bcd

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan's Multiple Range Test, .05 level.

## Observations of the 2012 Trial

Harvest started on March 16, about 10 days earlier than normal. Most cultivars emerged at the same time, with the exception of two plots of Guelph Millennium, that emerged one and two days after March 16. There were no frost events at all during the harvest. For the majority of the season, there was very little rain. At the end of six weeks, yields were starting to decline, so the decision was made to stop harvesting and not harvest for the full eight weeks. This was done to lessen the stress on the plants to minimize yield reductions in the next year.

The percentage of large diameter spears stayed the same or decreased slightly among cultivars with the exception of UC 157, which increased from 79% to 82%. Guelph Millennium decreased from 60% to 44%.

Total yields increased for most cultivars with the exception of Grande, Guelph Millennium, Jersey Giant, UC 115, and Apollo, which decreased. Recommended varieties available as one-year-old crowns for growers include Jersey Giant, Jersey Supreme, and Jersey King. For the 2013 planting year, Guelph Millennium will also be available.

## SUMMARY

Table 8. Asparagus Yield Totals and Rankings

Cultivar	'07 Yield <sup>1</sup>	'08 Yield	'09 Yield	'10 Yield	'11 Yield	'12 Yield	6 Year Total Yield	6 Year Ranking
UC 157	1155a	2385abc	3848abc	4397a	4897ab	5278ab	21960	6
Jersey Giant	944ab	2737ab	4494abc	5304a	6021ab	5390ab	24890	3
Jersey King	883abc	2458abc	3937abc	3992a	4902ab	5701ab	21873	7
Jersey Supreme	860abc	2485abc	4211abc	4759a	5696ab	6273ab	24284	4
UC 115	821abc	2314abc	3175 c	4204a	5102ab	4154 b	19770	8
Jersey Gem	734 bcd	2071 bc	3442abc	3712a	3770 b	4575ab	18304	11
Atlas	717 bcd	2523abc	3987abc	4716a	5630ab	5846ab	23419	5
Grande	703 bcd	3030a	4935a	5195a	6654a	6621a	27138	1
Apollo	555 cd	1781 c	3550abc	4204a	4220ab	4160 b	18470	10
Jersey Knight	456 de	1604 c	3233 bc	3821a	4233ab	5189ab	18536	9
Purple Passion	151 ef	1915 bc	3287 bc	3884a	4436ab	5280ab	18953	8
Guelph Millennium	86 f	2332abc	4868ab	6029a	6560ab	5293ab	25168	2

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan's Multiple Range Test, .05 level.

In a virgin soil (free of *Fusarium*), the expected productive life of an asparagus field (any cultivar) is 15-20 years. Growers feel that peak production occurs in the 6<sup>th</sup> or 7<sup>th</sup> year, with the best production occurring during years 7-12. There is a decline of production of about 5% per year in the 10<sup>th</sup> year and every year thereafter. After the 15<sup>th</sup> year, the field may no longer be economically profitable. Established asparagus growers recover their investment after the 5<sup>th</sup> year and years 5-10 are their most profitable years (7).

Data collection in this trial will be on-going for at least another eight years to evaluate the longevity of these cultivars. During this time, total yields between cultivars can be compared by getting a more realistic picture of how they perform over a period of 12 years.

## New Replicated Asparagus Cultivar Evaluation

An expansion of the original asparagus trial was made to evaluate new cultivars and experimental lines from plant breeders. Another replicated trial was planted adjacent to the original trial. Seeds were sown in the greenhouses of Aarons Creek Greenhouses in Buffalo Junction, VA in late January 2009 and transplants were planted into the field on April 28, 2009 in an Appling Sandy Loam soil.

A randomized complete block design with 12 plants per plot and 4 replications was used. The cultivars included NJ 953 and Jaleo from Vilmorin Seed Co., Brock Imperial and Early California from Brock Seed Co., and Hybrids #1, #2, and #3, from Neil Stone, University of California, Riverside.

**NJ 953** is an all-male hybrid from Rutgers University and should be more adaptable to warmer climates as compared with Jersey Giant.

**Jaleo** is a clonal hybrid from Vilmorin Seed Co., adaptable to warm climates.

**Brock Imperial and Early California** are hybrids from Brock Seed Co.

**Hybrids #1, 2, and 3** are clonal hybrids from Neil Stone, University of California – Riverside, bred to maintain good spear qualities with tight tips.

Table 7. New Asparagus Trial – Planted 2009 – First Harvest 2011

Cultivar <sup>1</sup>	Total Yield	lbs.>3/8" in diam.	lbs.<3/8" in diam.	Spears/Plant
Early California	1129a	1025a 91%	104a	2.3a
Hybrid #3	880ab	819ab 93%	61a	1.8a
Brock Imperial	722ab	626abc 87%	96a	1.6a
Hybrid #2	672ab	552abc 82%	120a	1.8a
Jaleo	657ab	614abc 93%	43a	1.3a
NJ 953	614ab	474 bc 77%	140a	1.8a
Hybrid #1	416 b	254 c 61%	162a	1.3a

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan's Multiple Range Test, .05 level.

### Observations of the 2011 Trial

For the first year of production, yields were similar to the 2007 yields in the older trial. Brock Imperial and Hybrid #3 produced spear lengths of 12 and 15 inches, respectively, while retaining spear tip tightness. Early California had spear diameters of up to 1 1/8 inches. Early California, Jaleo, and Hybrid #3 had 91%, 91%, and 93% of spears greater than 3/8 inches in diameter, respectively. The harvest period lasted for two weeks, starting on March 31, and ending on April 5, for a total of five harvests.

Table 8. New Asparagus Trial – Planted 2009 – Second Harvest 2012

Cultivar <sup>1</sup>	Total Yield	lbs.>3/8” in diam.	lbs. <3/8” in diam.	Spears/Plant
NJ 953	3302a	2372ab 72%	930a	12.3a
Early California	3162ab	2785a 88%	377 c	8.8 b
Jaleo	2596abc	2385ab 92%	211 c	6.8 b
Brock Imperial	2399 bcd	1933 bc 81%	466 bc	8.0 b
Hybrid #1	1881 cd	1220 c 65%	661 b	8.0 b
Hybrid #3	1855 cd	1521 c 82%	334 c	6.5 b
Hybrid #2	1577 d	1269 c 80%	308 c	5.5 b

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan’s Multiple Range Test, .05 level.

### Observations of the 2012 Trial

For the second year of production, yields increased dramatically over the previous year. Spear diameters averaged between 3/4 and 1 inch for most varieties. The harvest lasted for four weeks, starting on March 17 and ending on April 16 for a total of 20 harvests.

Table 9. Asparagus Yield Totals and Rankings

Cultivar	2011 Yield	2012 Yield	2 Year Total Yield	2 Year Ranking
Early California	1129a	3162ab	4291	1
Hybrid #3	880ab	1855 cd	2735	5
Brock Imperial	722ab	2399 bcd	3121	4
Hybrid #2	672ab	1577 d	2249	7
Jaleo	657ab	2596abcd	3253	3
NJ 953	614ab	3302a	3916	2
Hybrid #1	416 b	1881 cd	2297	6

<sup>1</sup>Cultivars with the same letter within columns are not statistically significant, Duncan’s Multiple Range Test, .05 level.

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7. John Pendleton  
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785-843-1409  
UC 157, Purple Passion

This list is intended only as a convenient reference for growers. Inclusion in the list does not imply endorsement by North Carolina State University, nor does exclusion imply that the crowns or seed of a particular source are inferior. The list does not pretend to be exhaustive, and undoubtedly there are other suitable sources of asparagus crowns and seed.

For a more in-depth look at asparagus production, order Publication 826, "Asparagus Production, Management, and Marketing", by Carl Cantaluppi and Robert Precheur, a 33 page bulletin which includes sites and soils, varieties, climate, yields, harvesting, handling, storage, direct marketing, growing white asparagus, maintaining the planting, insect, disease, and weed control, and estimated costs and returns of asparagus production.

It is a regional publication that focuses primarily on the northeast, Midwest, and southeastern U.S. It contains 26 color photographs, which show asparagus culture and the different insects and diseases of asparagus. For your copy, contact Carl Cantaluppi, Granville County Extension, P.O. Box 926, Oxford, NC 27565. Telephone: 919-603-1350, or e-mail [carl\\_cantaluppi@ncsu.edu](mailto:carl_cantaluppi@ncsu.edu)