

2002 Blueberry Cultivar Trial - Quicksand
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Although blueberries are a native fruit crop, only limited commercial acreage has been established in Kentucky. Blueberries have an excellent potential for local sales, and U-pick operations. Recent research into the health benefits of small fruits including blueberries may help increase sales even more. *Vaccinium* is increasing in popularity in the world of pharmaceuticals. As consumers become more conscious of the foods they eat, they may find themselves eating more blueberries. Scientists attribute the blueberry's healing powers to the flavonoid anthocyanin which is responsible for the blue berry color found only in the peel. Anthocyanins and other flavonoids could help fight the development of cancer, cardiovascular disease, as well as, eye problems such as glaucoma and poor night vision.

The high initial start up costs for blueberries, approximately four thousand dollars/ac., is mainly due to land preparation, plant, and labor costs. However, after the plants reach maturity in approximately five years, the profits should steadily increase to as high as six thousand dollars/ac. Each farmer must make planting decisions based on their own unique situation.

The longevity of a properly managed blueberry crop is similar to that of a well-managed apple orchard. Blueberries require acidic soils with a pH of 4.5 to 5.2, with good drainage and high organic matter. It is best to plant more than one cultivar to ensure good pollination and a continuous harvest of berries. Harvest usually begins in early June and lasts well into July.

Materials and Methods: Two blueberry plantings were established in the fall of 1996 at the University of Kentucky Robinson Station and the Laurel Fork Demonstration Site. Growth, yield and survival of various blueberry cultivars were compared between a normal silt loam site and a disturbed mine site. The plantings consisted of 8 to 12 rows of various cultivars in a randomized block design. Plants were 4 feet apart in raised beds 14 feet apart. Drip irrigation with point source emitters (2gph/plant) was installed shortly after planting. Plants were fertilized beginning in the spring of 1997. In 2002 one application of 5 lb./100 ft of 5-20-20 followed by two side dressings of 5 lb. ammonium sulfate/50 feet of row (at bloom and again two weeks latter) were applied. Netting was used at both sites to prevent loss due to birds. The Laurel Fork site is at a higher elevation and apple tree phenology at this site is 7-10 days later than similar cultivars at Quicksand.



Results: Twenty one (21) cultivars at Quicksand and 18 cultivars at Laurel Fork were tested and results are shown in (Tables 2, and 3) respectively. This year a cold wet spring with several freezes during bloom may have reduced yield. (April 6 and 7). It is believed that the flower buds of O'Neal a southern highbush cultivar are not hardy at our locations and its yield has been very low at both locations. The early blooming and maturing cultivar Duke has also continued to do poorly at both planting sites. The Laurel Fork reclamation site is about 500 feet higher in elevation than Quicksand and has much better air drainage. Moreover, based on time of apple tree bloom Laurel Fork plant development is about 7-10 days behind that seen at Quicksand. As a result in both 2001 and 2002 the blueberry yields were higher on the Laurel Fork disturbed soil site and the plants had thicker foliage and grew better. This is in contrast to the first harvest season where Quicksand was the more productive site.

At Quicksand, Brigitta was again the highest yielding cultivar followed by Blueray and Ozark Blue. Brigitta's yield was significantly higher than the other 12 cultivars initially planted at Quicksand. Brigitta is an attractive large fruited cultivar that matures late mid season in Kentucky with 82% of the fruit picked during the first four harvests. Ozarkblue is another attractive, medium-late maturing berry. Even though the Ozarkblue plants were a year younger than the initially planted blueberry cultivars, it had the fourth highest yield in 2002. Two North Carolina cultivars NC-1832 and NC-1827 gave relatively high yields at Quicksand. They had small-medium size berries with a pleasant but distinctive taste. NC-1832 tends to flower heavily and set fruit in the fall. Several other North Carolina numbered cultivars also appear to be latter maturing than the named cultivars in this trial. Plants of all five North Carolina selections grew rapidly this past summer and are going to be much larger plants than the named high bush cultivars. Late maturing blueberries in Kentucky will require protective sprays to prevent damage by Japanese Beetles.

At Laurel Fork, Bluecrop was the highest yielding blueberry (Table 3.) followed by Nelson, Bluejay, Blueray, and Toro. The largest berry sizes were those of O'Neal, Toro and Sierra. O'Neal had very few berries to reduce the average size. At Quicksand, Patriot and NC-2675 had the largest berry size. Based on visual appearance the most attractive blueberries at Quicksand were Brigitta, Blueray, Ozarkblue, Toro, NC-2675, and Bluegold. At Laurel Fork, Bluecrop, Nelson, Toro, Sierra, Duke and NC2852 were judged to be the most attractive. At the Quicksand blueberry site Jersey, Toro and Sierra have suffered some plant loss due to Phytophthora root rot. This data represents the third harvest response of the various cultivars after 4 ½ to 5 ½ years

growth. Additional harvests and observations will be needed to determine which cultivars are the best performing over time in Kentucky.

Literature cited

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| Table 1. 1996 Laurel Fork and Quicksand Blueberry Soil Test Results | | | | | | | |
|--|-----------|---------------|----------|----------|-----------|-----------|-----------|
| Location | pH | Buf-pH | P | K | Ca | Mg | Zn |
| Laurel Fork Mine Site ¹ | 5.9 | 7.2 | 46 | 206 | 1057 | 541 | 10.7 |
| Quicksand | 5.7 | 6.55 | 14 | 173 | 1497 | 126 | 5.1 |

1. Mine soil pH adjusted with granular sulfur at 2.5 lb/100 sq. ft in late summer 1996 2 months prior to planting. Both sites received 2.5 cubic ft of Canadian peat/50 sq. ft. of bed area prior to raised bed formation Additional peat 0.13 cubic ft was placed in each planting hole at the time of planting. Granular elemental sulfur 0.75 lb./100 sq. ft. was applied to the beds at Quicksand.

| Table 2 | 2002 Quicksand Blueberry Data | | | | | | |
|-----------------------------|--------------------------------------|-------------------------------|---------------------------------------|--------------------------|-------------------------------|---|--|
| Cultivar¹ | Fruit Yield (lb.)/bush | Berry Size (oz.)/berry | Visual size rating³ | Taste⁴ | appearance⁵ | % total fruit first two harvests⁶ | % total fruit first four harvests⁶ |
| Brigitta | 5.62 A | 0.053 A | L | ST | A+ | 8.6 | 82 |
| Blueray | 3.82 B | 0.047 A | L | ST | A+ | 49.2 | 95.5 |
| Ozarkblue | 3.81 B | 0.056 A | L | ST | A+ | 1.9 | 71.1 |
| Toro | 3.18 BC | 0.060 A | L | SB | A+ | 44.3 | 99.9 |
| Reka | 2.5 BC | 0.039 A | M | ST | A | 65.0 | 95.9 |
| Bluejay | 2.35 BC | 0.028 A | M | SB | A | 39.3 | 99.5 |
| Sierra | 2.30 BCD | 0.037 A | LM | ST | A+ | 43.9 | 98.0 |
| Patriot | 2.17 BCD | 0.044 A | L | ST | A+ | 48.8 | 87.7 |
| Bluecrop | 1.76 CDE | 0.095 A | L | SB | A+ | 39.3 | 93.7 |
| Jersey | 1.66 CDE | 0.038 A | M | B | A | 22.3 | 97.5 |
| Nelson | 1.53 CDE | 0.043 A | L | ST | A+ | 25.3 | 94.5 |
| O'Neal* | 0.56 DE | 0.035 A | M | SB | A | 74.0 | 88.9 |
| Duke | 0.35 E | 0.062 A | ML | S | A- | 89.6 | 100 |
| LSD2 | 1.789 | 0.1405 | | | | | |
| NC1832* | 4.6 A | 0.030 C | SM | BS | A | 0.0 | 51.8 |
| NC1827* | 4.2 AB | 0.031 C | SM | ST | A | 0.0 | 73.3 |
| Ornablue | 3.1 BC | 0.024 C | S | B | A | 31.3 | 81.3 |

| | | | | | | | |
|------------------|---------|-------------|----|----|----|------|------|
| NC2675* | 3.0 BC | 0.073 A | L | SB | A+ | 75.3 | 100 |
| Bluegold | 2.4 CD | 0.051 B | ML | T | A+ | 54.9 | 99.7 |
| NC1852* | 1.9 CDE | 0.063 AB | LM | SB | A | 18.7 | 94.7 |
| NC2852* | 1.4 DE | 0.033 C | S | S | A | 67.3 | 98.8 |
| Spartan | 0.75 E | 0.066 AB | M | SB | A- | 40.5 | 100 |
| LSD ² | 1.369 | 0.014 | | | | | |

* Cultivars followed by an * are 1 year younger than the other cultivars in the trial. Some cultivars were furnished by Hartman's Plant Company, PO Box 100, Lacota, MI 49063. Other cultivars were purchased from Fall Creek Farm & Nursery Inc. 39318 Jasper-Lowell Rd., Lowell, OR 97452.

1. In descending order of yield.
2. LSD is Least significant difference at 5%. Numbers followed by the same letter do not differ significantly.
3. Visual Size rated as to size visually. S=small, M=medium, L=large, VL=very large
4. Taste - S=sweet, T=tart, B=bland
5. Appearance: A-=below average, A=average, A+ =above average
6. Harvest dates 6/07, 6/14, 6/21, 7/01, 7/04, 7/08, 7/15. A 38 day harvest season.

| Table 3 | 2001 Laurel Fork Blueberry Data | | | | | | |
|-----------------------------|--|-------------------------------|---------------------------------------|--------------------------|-------------------------------|---|--|
| Cultivar¹ | Fruit Yield (lb.)/bush | Berry Size (oz.)/fruit | Visual size rating³ | Taste⁴ | appearance⁵ | % total fruit first two harvests⁶ | % total fruit first four harvests⁶ |
| Bluecrop | 4.75 A | 0.047 B | M | B | A+ | 53.6 | 80.3 |
| Nelson | 4.61 AB | 0.063 B | L | S | A+ | 58.8 | 83.5 |
| Bluejay | 4.58 AB | 0.039 B | M | B | A | 71.0 | 92.2 |
| Blueray | 3.70 ABC | 0.058 B | M | BS | A | 77.2 | 90.8 |

| | | | | | | | |
|------------------|----------|----------|-----|----|----|------|------|
| Toro | 3.30 BC | 0.074 AB | L | S | A+ | 86.5 | 97.1 |
| Sierra | 3.21 BC | 0.066 AB | L | S | A+ | 77.2 | 95.1 |
| Ornablue | 3.13 C | 0.030 B | S | BS | A | 75.4 | 91.1 |
| Patriot | 3.08 C | 0.044 B | S-M | T | A | 80.4 | 93.7 |
| Brigitta | 3.08 C | 0.050 B | L | S | A | 18.2 | 69.1 |
| Bluegold | 2.95 C | 0.047 B | M | S | A | 75.3 | 91.6 |
| Reka | 2.66 C | 0.038 B | S-M | B | A- | 78.8 | 96.7 |
| O'Neal* | 0.33 D | 0.109 A | M | B | A | 94.7 | 98.9 |
| Duke | 0.30 D | 0.055 B | M | B | A+ | 100 | 100 |
| LSD2 | 1.449 | 0.044 | | | | | |
| | | | | | | | |
| NC2675* | 1.03 A | 0.040 B | M | ST | A | 30.7 | 67.2 |
| NC1827* | 0.803 A | 0.023 C | S-M | ST | A | 40.6 | 95 |
| NC1852* | 0.777 A | 0.046 A | M | BS | A | 95.6 | 100 |
| NC2852* | 0.4853 | 0.041 AB | S | S | A+ | 91.6 | 100 |
| NC1832* | 0.2907 A | 0.025 C | S | S | A | 12.6 | 75.0 |
| LSD ² | 0.7400 | 0.00468 | | | | | |

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3. Visual Size rated as to size visually. S=small, M=medium, L=large, VL=very large
4. Taste - S=sweet, T=tart, B=bland
5. Appearance: A-=below average, A=average, A+ =above average 1. In descending order of yield.
6. Harvest dates 6/08, 6/15, 6/20, 6/29,7/09, 7/16. A 38 day harvest season.