First Year Vigor of Primocane Fruiting Blackberries From the University of Arkansas Breeding Program Grown in Kentucky

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Abstract

Primocane fruiting blackberries have the potential to produce a niche-market crop for Kentucky growers from late summer until frost. The objective of this study was to determine the suitability of advanced primocane fruiting (APF) blackberries from the University of Arkansas Fruit Breeding Program for production in Kentucky. In June 2006, six selections of APF blackberries from the University of Arkansas breeding program (APF-27, APF-40, APF-41, APF-42, APF-46, and APF-77) and the commercially available primocane fruiting selections Prime-Jim® and Prime-Jan®, were established at the Kentucky State University Research Farm. Plants were arranged in a randomized complete block design, with 4 blocks, including 5 plants of each cultivar per block (20 plants of each cultivar). On October 10, 2006, survival, total number of canes, total number of flowering/fruiting canes, and vigor (rated visually from 0 to 10) were evaluated in each plot/block for each genotype. First season survival was excellent for all APF selections. There was a similar number of canes produced in each plot for each genotype; however, the number of flowering canes varied by genotype, with APF-46 producing the most flowering/fruiting canes (15), and APF-27 and APF-77 producing the fewest flowering/fruiting canes (4). Vigor was similar for all genotypes; however, there was a trend for Prime-Jim® and Prime-Jan® plants to be less vigorous than APF selections. First year survival and vigor were acceptable for APF selections; however, flower, fruiting, and disease resistance characteristics will need to be evaluated over the next 5 years to determine suitability for Kentucky growers.

Introduction

• With the decline of the United States tobacco industry, many farmers in Kentucky and the Southeastern U.S. are interested in new high-value crop opportunities (Snell, 2005).

• Kentucky's climate is well-suited for blackberry production; winters are generally not severe, although there is disease pressure that comes with the high humidity and temperatures in the region.

• Wild blackberries have historically been widely harvested in Kentucky, with "U-Pick" and small-scale commercial production emerging in recent years.

• Blackberry fruits do not store or ship well, limiting market area, but increasing the demand for local fruit; demand for blackberries often exceeds supply in Kentucky (Ernst et al. 2001).

• Blackberry acreage in Kentucky has increased by 60% since 1997; there are currently 150 acres of blackberries in the state (Jones et al. 2005; http://www.usda.gov/nass).

• Primocane fruiting blackberries, such as Prime-Jim® and Prime-Jan®, have the potential to produce a niche-market crop in late summer and into fall on the current season primocanes; these varieties flower and fruit from late summer until frost.

• However, late summer temperatures above 85°F can greatly reduce fruit set, size and quality on primocanes; which results in substantial reductions in yield and fruit quality in areas with this temperature range in late summer and fall (Clark et al., 2005).

Objective

The objective of this study was to determine suitability of advanced selections of primocane fruiting blackberries from the University of Arkansas Fruit Breeding Program for production in Kentucky.

Materials and Methods

The variety trial was established in June 2006 with six advanced selections of primocane fruiting blackberries from the University of Arkansas Blackberry Breeding Program (APF-27, APF-40, APF-41, APF-42, APF-46, and APF-77) and the commercially available primocane fruiting blackberries Prime-Jim® and Prime-Jan® (Indiana Berry and Plant, Huntingbird, IN). Plants were arranged in a randomized complete block design, with 4 blocks, including 5 plants of each cultivar per block (total of 20 plants of each cultivar).

1. 2. 3.

Figure 1. First-year flowers on primocane fruiting blackberry.
Figure 2. First-year fruit on primocane fruiting blackberry.

4. 5. 6. 7.

Table 1. First year survival, total number of canes, total number of flowering/ fruiting canes, and vigor (rated visually from 0 to 10) evaluated on October 10, 2006 in Kentucky for each primocane fruiting blackberry selection established.

Selection	*Survival*	*# of canes*	*# of flowering or fruiting canes*	*Vigor*
APF-27	100 a	39	4 d	6.6
APF-40	100 a	32	6 cd	6.1
APF-41	100 a	34	5 cd	6.8
APF-42	100 a	32	6 cd	6.0
APF-46	100 a	39	15 a	7.0
APF-77	100 a	29	4 cd	6.0
PrimeJan	85 a	31	12 bc	4.1
PrimeJim	55 b	22	9 bc	5.0
P-value	0.001	0.020	0.001	0.052
Significance	***	N.S.	***	N.S.

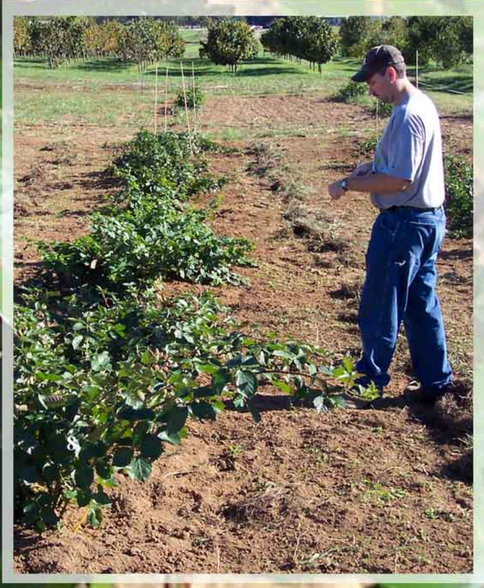

Figure 3: Evaluating APF selections in the field, October 2006.

Materials and Methods, continued

Spacing was 2 feet between each plant, and 5 feet between groups of 5 plants; with each row being 70 feet in length. Rows were spaced 14 feet apart. The planting has been maintained through a combination of regular irrigation, fertigation, mechanical and manual weed control, and the installation of a temporary trellis system. Solar powered electric fencing was also installed to reduce feeding damage caused by deer. On October 10, 2006, survival, total number of canes, total number of flowering/ fruiting canes, and vigor (rated visually from 0 to 10) were evaluated in each plot/block for each genotype. All data collected was subjected to GLM analysis of variance using the statistical program Costat (CoHort Software, Monterey, Calif.). Means were separated based on LSD means testing at a significance level of $P < 0.05$.

Results

• First season survival was excellent for all APF selections; however, the survival of Prime-Jim® plants was poor at 55% (Table 1).

• There was a similar number of total canes produced in each plot of 5 plants; however, the number of flowering/fruiting canes varied by genotype with APF-46 producing the most flowering/fruiting canes (15), and APF-27 and APF-77 producing the fewest flowering/fruiting canes (4).

• Vigor was similar for all genotypes; however, there was a trend for Prime-Jim® and Prime-Jan® plants to be less vigorous than the APF selections.

Discussion

• Primocane fruiting blackberries have the potential to produce a niche-market crop for Kentucky growers from late summer until frost; However, the currently available primocane blackberry selections Prime-Jim® and Prime-Jan® are not suitable for commercial production.

• First year survival and vigor were similar for all selections; however, there was already variation in early flowering and fruiting during the first year of establishment of the planting with APF-46 producing significantly more flowering/fruiting canes than other selections.

• Although first year survival and vigor were acceptable for APF selections, fruit weight, flavor, total yield, flowering and harvest dates, disease/insect resistance, and overall plant vigor characteristics will need to be evaluated over the next 5 years to determine suitability for Kentucky growers.

Conclusions

•First year survival and vigor were acceptable for all APF selections.

• Flower, fruiting, and disease/insect resistance characteristics evaluated over the next 5 years will determine suitability for Kentucky growers.

References

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