

# Cultivar Evaluation of Three Primocane-Fruiting Blackberry Selections from Arkansas and Grown in Iowa

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## Introduction

Blackberries are a common seasonal fruit in southern Midwestern states and have potential in the Iowa markets as a berry crop. However, most floricanes-fruiting blackberry cultivars do not possess sufficient winter hardiness for Iowa climatic conditions and growers may lose the fruit crop when cold temperatures damage floricanes. The introduction of primocane-fruiting blackberries helps to alleviate the risk of low temperature injury to the floricanes and extends the blackberry fruiting season into the fall. However, the fruits of primocane-fruiting cultivars need to mature before fall frosts occur. The objective of this study was to evaluate the fruiting potential of three primocane-fruiting blackberry selections that were bred at the University of Arkansas by Dr. John Clark and were grown outdoors in Iowa.

## Materials and Methods

The plants were established at the Iowa State University Horticulture Research Station in the spring of 2007 from tissue culture plants. Plants were established three feet apart within rows. Four replications of two plants were established in a randomized complete block design. Plant biomass growth, as dormant pruning weights, was measured in early spring of 2008 by weighing the pruned canes that were cut off at ground level. Weeds were controlled by hand hoeing the plots. Primocane shoots were tipped when they

reached one meter in height from June 20 to August 8. Fruit weight, number, and average berry weight were collected from August 5 to October 17 and totaled for each replication and selection. Unopened flowers, opened flowers, immature fruit, and mature fruit were collected and counted on October 21 from plants after the first killing frost on October 16. Unopened flowers were flowers that had not unfurled their petals. Opened flowers were flowers that had unfurled their petals before berry receptacle swelling. Immature fruit were fruit that had swollen receptacles and did not have mature colors (purple/black). Mature fruit were fruit that had colored. All data presented in Tables 1 and 2 are averages per plant.

## Results and Discussion

Harvest occurred from August 5 to October 17, 2008. Low temperatures occurred at the Horticulture Station on October 10 (37°F air temp. recorded at the Station) and October 16 (34°F). There was no damage observed on the flowers or fruit from the temperatures on October 10. However, flowers and fruit were killed on October 16. Colored or mostly colored berries showed no visual symptoms of freeze damage on both dates. Results showed that more berries were harvested from the APF-46 selection than the APF-45 selection (Table 1). Average berry weight was greatest from the APF-41 selection than the other two cultivars (Table 1). Although there were no differences in total harvested weight among the three selections, APF-41 showed larger berry size. There were no differences in pruning weights and total yield among the three cultivars. There also were no differences regarding immature flowers and mature fruit among the cultivars at time of frost. Flower and immature

fruit data suggest that all selections of primocane-fruiting blackberries would have continued to produce fruit and may be more suited to a longer growing season or production in a high tunnel to hasten and/or extend the season. The project will be continued in 2009 to obtain additional yield

data and growth variables under different weather conditions.

### Acknowledgements

We thank the staff at the Horticulture Research Station for their assistance with plot maintenance to complete the study.

**Table 1. Pruning weight, total yield, total berry number, and average berry weight from three cultivars of primocane-fruiting blackberries grown in central Iowa.**

| Cultivar            | Pruning weight <sup>z</sup> | Total yield (g) <sup>z</sup> | Total berry number <sup>z</sup> | Average berry weight (g) <sup>y</sup> |
|---------------------|-----------------------------|------------------------------|---------------------------------|---------------------------------------|
| APF-41              | 183.5                       | 266                          | 40 ab                           | 6.65 a                                |
| APF-45              | 186.7                       | 173                          | 34 b                            | 5.09 ab                               |
| APF-46              | 106.9                       | 258                          | 68 a                            | 3.79 b                                |
| LSD $P \leq 0.05^x$ | NS                          | NS                           | 33                              | 2.06                                  |

<sup>z</sup>Means are averages per plant and totaled for the entire 2008 growing season.

<sup>y</sup>Means calculated by dividing total yield by total berry number per plant.

<sup>x</sup>Least significant difference at  $P \leq 0.05$ ; NS = no significant difference; values sharing the same letter are not statistically different from each other.

**Table 2. Unopened flowers, opened flowers, immature fruit, and mature fruit counts after the first killing frost (October 16, 2008) in central Iowa from three cultivars of primocane-fruiting blackberries.**

| Cultivar            | Unopened flowers | Opened flowers | Immature fruit | Mature fruit |
|---------------------|------------------|----------------|----------------|--------------|
| APF-41              | 52 <sup>z</sup>  | 93             | 88             | 6            |
| APF-45              | 41               | 54             | 62             | 1            |
| APF-46              | 81               | 90             | 70             | 3            |
| LSD $P \leq 0.05^y$ | NS               | NS             | NS             | NS           |

<sup>z</sup>Means are average number of flower or fruit per plant.

<sup>y</sup>Least significant difference at  $P \leq 0.05$ ; NS = no significant difference; values sharing the same letter are not statistically different from each other.