



# Flowering and Yield Characteristics of Primocane Fruiting Blackberries from the University of Arkansas Breeding Program Grown in Kentucky



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## Introduction

- Primocane fruiting blackberries have the potential to produce a niche-market crop for Kentucky growers from late summer until frost.
- This new type of blackberry has the potential to produce more than one "crop" per year, having the potential for the normal summer crop (floricane) and a later crop on the current season primocanes.
- Primocane blackberry selections can be pruned by mowing the canes down in the winter; this also provides anthracnose, cane blight, and red-necked cane borer control without pesticides.
- The first commercial primocane-fruited blackberry varieties, Prime-Jim® and Prime-Jan®, were released by the University of Arkansas in 2004 (Clark et al., 2005).
- Summer temperatures above 85°F (29°C) 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 summer and fall (Clark et al., 2005; Stanton et al., 2007).

## Objective

To determine if advanced selections developed by the University of Arkansas Blackberry Breeding Program were superior to Prime-Jim® and Prime-Jan® in terms of flowering and yield under Kentucky growing conditions.

## Materials and Methods

In June 2006, a blackberry variety trial was established with the two commercially available primocane fruiting cultivars Prime-Jim® and Prime-Jan® (both thorny erect, primocane-fruited) and the Arkansas Primocane Fruiting (APF) selections APF-27, APF-40, APF-41, APF-42, APF-46, and APF-77 (all thorny erect, primocane-fruited), that are advanced selections from the University of Arkansas blackberry breeding program, at the KSU Research and Demonstration Farm, in Frankfort, KY. 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) in a 10 foot plot. 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. This trial was managed with organic practices following the National Organic Program standards. Weed control was achieved with straw mulch and hand weeding. Plants were irrigated weekly with t-tape laid in the rows. The percentage of plants that survived was evaluated in September of 2006, with 100% of APF, 80% of Prime-Jim® plants, and 78% of Prime-Jan® plants surviving. An April freeze event destroyed all floricane flower buds on all selections in 2007, so only primocane fruit production was recorded.

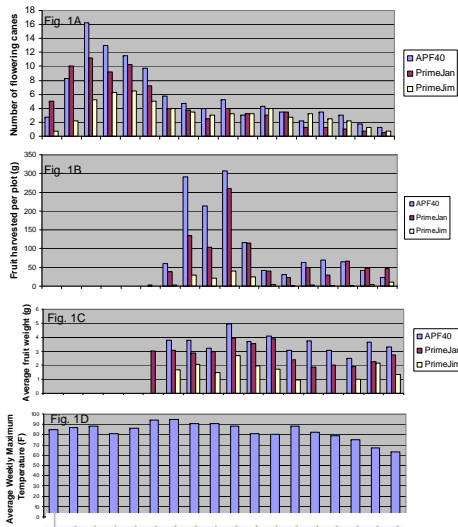


Fig. 1A: Number of flowering primocanes per plot from late-June until late-October for the selections APF-40, Prime-Jan®, and Prime-Jim®; Fig. 1B: Fruit harvested per plot (g) from late-June until late-October for the selections APF-40, Prime-Jan®, and Prime-Jim®; Fig. 1C: Average fruit weight from late-June until late-October for the selections APF-40, Prime-Jan®, and Prime-Jim®; Fig. 1D: Average weekly maximum temperature late-June until late-October 2007.

Table 1. Yield and berry weight in 2007 for six advanced primocane fruiting selections from the University of Arkansas Blackberry Breeding Program and the primocane fruiting cultivars Prime-Jan® and Prime-Jim®.

Selection	Yield (lb/acre)	Berry weight (g)
APF-27	1931 b	2.8 bc
APF-40	3180 a	3.9 a
APF-41	1738 b	3.7 a
APF-42	1974 b	2.2 db
APF-46	1677 b	2.6 cd
APF-77	2136 b	3.1 b
Prime-Jan®	2235 ab	3.2 b
Prime-Jim®	367 c	1.9 d
P-value	0.001	0.001
Significance	***	***

## Materials and Methods (Cont)

Beginning in mid-August, ripe fruit were harvested from plants each Monday and Thursday until October 26th. Primocanes were tipped on all selections at one meter in early June and again in September to promote lateral branching and flowering. The number of flowering canes per plot was evaluated weekly. Analysis of variance and mean separation using LSD tests (significance level of P<0.05) were performed on the data using Costat v6.003.

## Results and Discussion

- An April freeze event destroyed all floricane flower buds on all selections in 2007, so only primocane fruit production was recorded.
- Flowering began in late-June and continued until frost on Oct. 26; however, the most flowering primocanes for all selections, for example APF-40, Prime-Jan® and Prime-Jim®, were observed in June and July (Fig 1A).
- Primocane harvest for selections began in and peaked in August (Fig 1 B), except for the slightly later selections APF-41 and APF-77 (data not shown).
- Fruit size was similar for all selections throughout the harvest period (Fig 1C).
- Summer 2007 was hot, with most weeks having maximum daily temperatures averaging over 85°F (29°C) (Fig 1D) and 79 days had maximum temperatures over 85°F in June, July, and August in Kentucky.
- Even with these warm temperatures; Prime-Jan® (2235 lbs/acre) still out-produced all selections with the exception of APF-40 (3180 lbs/acre) (Table 1); APF-40 also had a larger average berry weight than Prime-Jan®.
- Prime-Jim® had the lowest yield (367 lbs/acre) of any selection in the trial and primocane fruit set of this selection may be more negatively impacted by temperatures over 85 °F than Prime-Jan®; Prime-Jim® also had fewer flowering canes than Prime-Jan®.
- Additional evaluation will be needed over the next several years before decisions are made on whether any APF selections will be released to the public by the University of Arkansas.

## Conclusion

- The selection APF-40 had larger fruit than either Prime-Jan® or Prime-Jim® and yielded well; however, additional evaluation will be needed over the next several years before decisions are made on whether any APF selections will be released to the public by the University of Arkansas.

## References

Clark, J.R., J. N. Moore, J. Lopez-Medina, C. Finn, P. Perkins-Veazie. 2005. 'Prime-Jan' ('APF-8') and 'Prime-Jim' ('APF-12') Primocane-fruited Blackberries. HortScience 40:852-855.

Stanton, M.A. J. C. Scheerens, R. C. Funt, and J. R. Clark. 2007. Floral Competence of Primocane-fruited Blackberries Prime-Jan and Prime-Jim Grown at Three Temperature Regimens. HortScience, 42: 508 - 513.

