'Kiowa' Blackberry

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'Kiowa' is the eighth in a series of erect-growing, high-quality, productive blackberry (*Rubus* L. subgenus *Rubus* Watson) cultivars developed in the breeding program of the Arkansas Agricultural Expt. Station. 'Kiowa' produces larger fruit and has a longer harvest period than previously released Arkansas cultivars.

Origin

'Kiowa' (tested as Ark. 1380) resulted from a cross of Ark. 791 x Ark. 1058 made in 1980 (Fig. 1). The original plant was selected from a seedling field in 1983 at the Univ. of Arkansas Fruit Substation, Clarksville. Since then, it has been tested at four locations in Arkansas and on experiment stations in several other states.

Description

'Kiowa' produces thorned canes, with thorn size and density similar to that of 'Shawnee'. Canes are not as erect as those of 'Shawnee', but are self-supporting and require no trellis.

In Arkansas tests, 'Kiowa' generally has been less productive than 'Shawnee', and its productivity has been similar to 'Choctaw' (Table 1). 'Kiowa' appears to be equally adaptable in all sections of Arkansas and has performed well in eastern Texas (John Lipe, personal communication).

A major attribute of 'Kiowa' is its large fruit size. It consistently produces fruit that are 30% heavier than 'Shawnee' and are nearly double the weight of 'Choctaw' (Table 2). 'Kiowa' produces large fruit throughout the harvest season (Fig. 2).

In spring, budbreak occurs slightly earlier on 'Kiowa' than on 'Shawnee' and 'Choctaw', but 'Kiowa' blooms later than the other cultivars (Table 3). The first picking of 'Kiowa' fruit occurs an average of 3 days later than that of 'Shawnee', and peak harvest occurs ≈6 days

later than for 'Shawnee'. The harvest season of 'Kiowa' is long, with fruit ripening over 6

weeks compared to the 4- to 6-week harvest periods for most blackberry cultivars (Table 3 and Fig. 2).

'Kiowa' fruit are blocky and oblong and have an attractive, glossy black finish (Fig. 3). The fruit is firmer than that of 'Shawnee' or 'Choctaw' (Table 3) and has a longer storage life at 2, 5, and 10C than that of 'Shawnee'. It does not store as well as 'Navaho' (Penny Perkins-Veazie, personal communication). Color retention of harvested 'Kiowa' fruit is better than that of 'Shawnee' or 'Cheyenne',

Fig. 1. Pedigree of 'Kiowa' blackberry.

Table 1. Yield (in t·ha⁻¹) of three blackberry cultivars at four locations in Arkansas.

Cultivar	1990 ^z	1991 ^z	1992 ^z	1993 ^y	1994 ^y
<i>Clarksville</i>					
Kiowa	4.2 b ^a	12.6 b	12.0 a	7.2 a	7.6 b
Shawnee	9.3 a	17.0 a	14.3 a	7.7 a	12.3 a
Choctaw	3.0 b	13.9 b	3.7 b	5.1 b	6.9 b
<i>Hope</i>					
Kiowa	1.1 b	10.8 b	10.9 a	5.1 b	12.8 b
Shawnee	5.8 a	11.8 ab	10.1 a	9.7 a	18.2 a
Choctaw	7.2 a	16.8 a	9.0 a	5.1 b	8.5 c
<i>Fayetteville</i>					
Kiowa	---	---	---	3.0 a	7.3 b
Shawnee	---	---	---	3.5 a	15.4 a
Choctaw	---	---	---	4.8 a	13.9 a
<i>Bald Knob</i>					
Kiowa	---	---	---	7.7 a	8.0 ab
Shawnee	---	---	---	5.9 ab	9.7 a
Choctaw	---	---	---	4.2 b	6.2 b

^zPlanting established in Apr. 1989.

^yPlanting established in Apr. 1992.

^aMean separation within locations within columns by Duncan's multiple range test at $P \leq 0.05$.

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but is not as good as that of 'Navaho' or 'Arapaho' (Penny Perkins-Veazie, personal communication). The fresh fruit flavor rates equal to or superior to the flavor of 'Shawnee'. Soluble solids concentration in 'Kiowa' fruit

is usually higher than for 'Shawnee' or 'Choctaw' fruit (Table 3). Seed size, as determined by average dry seed weight, is similar to that of 'Shawnee' but is much larger than that of 'Choctaw' (Table 3).

'Kiowa' plants are not as vigorous or erect as 'Shawnee' or 'Choctaw' plants (Table 3). However, fruiting row establishment has been good, using either plants or root cuttings. For best production, primocanes of 'Kiowa' should be tipped in summer when they reach 1.0 to 1.2 m high, and lateral branches should be pruned to 40 cm during winter dormancy.

'Kiowa' is moderately resistant to anthracnose [*Elsinoë veneta* (Burkh.) Jenkins], and there have been no disease problems following a fungicide program consisting of a single application of liquid lime sulfur at budbreak. There has been no orange rust [*Gymnoconia nitens* (Schwein.) F. Kern & H.W. Thurston] on 'Kiowa'. The reaction of plants to rosette [*Cercospora rubi* (Wint.) Plakidas] has not been determined. Plants have shown no visible injury following field exposure to -23C, and annual ratings for cold hardiness indicate that 'Kiowa' is as hardy as 'Shawnee' and more hardy than 'Choctaw' (Table 3).

The outstanding characteristics of 'Kiowa' are its large fruit size, which is maintained throughout the harvest season, and its long ripening period. 'Kiowa' will be of value for markets in which large fruit and an extended harvest season are desired. Its fruiting charac-

Table 2. Fruit weight (in g/fruit) of three blackberry cultivars at four locations in Arkansas.

Cultivar	1990 ^z	1991 ^z	1992 ^z	1993 ^y	1994 ^y
<i>Clarksville</i>					
Kiowa	9.9 a ^x	10.3 a	9.8 a	11.1 a	10.0 a
Shawnee	7.4 b	6.7 b	7.0 b	7.6 b	5.9 b
Choctaw	5.1 c	4.9 c	5.3 c	6.1 c	4.8 c
<i>Hope</i>					
Kiowa	8.3 a	9.0 a	8.1 a	13.0 a	10.0 a
Shawnee	6.9 b	6.3 b	5.2 b	9.0 b	6.7 b
Choctaw	5.4 c	4.4 c	4.2 c	4.9 c	4.2 c
<i>Fayetteville</i>					
Kiowa	---	---	---	9.6 a	7.0 a
Shawnee	---	---	---	5.9 b	5.1 b
Choctaw	---	---	---	5.8 b	3.8 c
<i>Bald Knob</i>					
Kiowa	---	---	---	9.3 a	6.8 a
Shawnee	---	---	---	5.6 b	3.7 b
Choctaw	---	---	---	4.6 c	2.7 c

^zPlanting established in Apr. 1989.

^yPlanting established in Apr. 1992.

^xMean separation within locations within columns by Duncan's multiple range test at $P \leq 0.05$.

Fig. 2. Fruit weight of three blackberry cultivars at successive harvests at Fruit Substation, Clarksville, Ark. [means of five harvest years (1990 to 1994)].

Table 3. Plant and fruit characteristics of blackberry cultivars at Fruit Substation, Clarksville, Ark.

Characteristic	Kiowa	Shawnee	Choctaw
Date			
Budbreak ^z	22 Feb.	25 Feb.	25 Feb.
50% bloom ^y	2 May	30 Apr.	26 Apr.
Harvest^y			
First	12 June	9 June	31 May
Peak	30 June	24 June	10 June
Last	23 July	11 July	22 June
Fruit			
Firmness ^{x, w}	8.0	7.5	7.6
Flavor ^{x, w}	8.2	7.6	8.7
Fruit size ^{x, w}	10.0	8.1	7.0
Seed size			
(mg/seed) ^y	3.8 a	3.9 a	1.9 b
SSC (%) ^{y, u}	10.3	9.9	9.2
Plant			
Vigor ^{x, w}	7.6	9.8	9.0
Health ^{x, w}	8.6	8.8	9.0
Erectness ^{x, w}	7.2	9.4	8.9
Winter injury ^{y, w}	9.5	9.6	8.2

^zMeans of 2 years (1992 and 1994).^yMeans of 5 years (1990 to 1994).^xMeans of 9 years (1986 to 1994).^wRating scale 1 to 10, where 10 = best.^yData from 1994, mean separation in row by Duncan's multiple range test at $P \leq 0.05$.^uSSC = soluble solids concentration.

Fig. 3. Fruit of 'Kiowa' blackberry.

teristics also should make 'Kiowa' popular as a home-garden cultivar. 'Kiowa' is expected to perform well in areas in which 'Shawnee' is adapted.

Availability

An application for a U.S. plant patent has been filed for 'Kiowa'. A list of nurseries

licensed to propagate and to sell 'Kiowa' can be obtained from J.N.M., 316 Plant Science Building, Univ. of Arkansas, Fayetteville, AR 72701.