

Blackberry Evaluation and Production in the Rio Grande Valley

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Blackberries (*Rubus* L. subgenus *Eubatus*) have been grown in the Rio Grande Valley for many years, principally as dooryard plants. The authors know of only two attempts to grow this plant commercially. One was in the Rio Bravo area of Tamaulipas, Mexico and the other was near Weslaco, Texas (unpublished data). There is no information as to why these were unsuccessful. In both cases the variety was 'Brazos' which was released by Texas A&M Experiment Station in 1959 (Morris et al. 1961).

There are many available blackberry varieties in Texas but there is no record of their having been evaluated in the Rio Grande Valley of Texas. Therefore, in 1990 we began to screen commercially-available blackberry varieties with emphasis on those having erect canes which facilitate their culture and harvest.

Herein we report the results of two tests, a 1990 screening test for adaptability, and 1992 and 1993 evaluation and production comparisons of eight cultivars in a replicated field test at Rio Farms, Inc. located at Monte Alto, Texas. The soil has a pH of 7.8 and soil type is Hidalgo sandy clay loam. In 1990, the irrigation water contained 900-1100 ppm of soluble salts on each of the four irrigations.

MATERIALS AND METHODS

The blackberry plants for the screening test (Table 1) were purchased as bare-rooted plants from Ison Nursery, Brooks, Georgia, and Boston Mountain Nursery, Mountainburg, Arkansas. 'Navaho', 'Shawnee', 'Cheyenne' and 'Cherokee' were obtained from Dr. James Moore, University of Arkansas, Fayetteville. 'Cowley' was obtained from W.R. Cowley, former Texas A&M Experiment Station Director, Weslaco, Texas (Scott and Lukefahr, 1994).

The root cuttings used in the 1992 and 1993 evaluation and production test were obtained from Plantation Pines Nursery, Tyler, Texas and Bob Wells Nursery, Lindale, Texas. However, 'Cowley' root cuttings were taken from plants in the 1990 screening test.

Screening Test for Adaptability. Sixteen blackberry cultivars were planted in a randomized complete block with six replicates of three plants/replicate on March 8, 1990. On April 17 three additional cultivars, 'Brisson', 'Cowley' and 'Choctaw', were included in observation plots. Biweekly counts of plants were made to record establishment and survival. The results from this screening test are presented in Table 1.

Evaluation and Production Test. On January 18, 1991, owing to available root cuttings from 'Womack', it and seven other blackberry varieties which showed adaptability in the 1990 screening test, were planted in a randomized complete block with six replicates. Each treatment was 12.2 m (40 feet) long and separated from other plots by a 3.6 m (12 ft.) alley. Root cuttings 10.2 cm (4 in.) long and

10 to 13 mm in diameter were planted at 61 cm (2 ft.) intervals and covered with 50 mm of soil.

Herbicides: Simazine [2-chloro-4,6-bis (ethylamino)-s-triazine] at 1.12 kg/ha active and oryzal (3,5-dinitro-N₄, N₄-dipropyl-sulfanilamide) at 5.7 l/ha were applied on January 30, 1991. Oryzolin at 14 l/ha was applied on March 18, 1993.

Fertilization: In both 1992 and 1993, ammonium sulphate was applied to all plots at the rate of 112 kg nitrogen/ha shortly after harvest.

Pruning: After harvest was completed in 1992 and 1993, the plants were shredded with a conventional stalk shredder at approximately 51 cm above ground. New canes began appearing within ten days. On February 16, 1993, the bushes were pruned laterally with a gasoline-powered backpack circular saw to remove low lateral branches.

Flower counts: In 1993, all flowers on 1.5 m of permanently marked row in each replicate were counted twice weekly.

Yield records: In 1992 and 1993, berries were harvested from 1.5 m long marked row segments three times weekly until production virtually ceased.

RESULTS

Table 1 summarizes the results of the screening trial. As shown, several varieties were not adapted to the Rio Grande Valley weather, soil and irrigation water. At 120 days after planting, only nine varieties had 66 percent or more survival. Eight of these were planted January 18, 1991, into the replicated production and evaluation test.

Table 2 shows the percentage of root cuttings that had produced shoots 4,5,6,7 and 8 weeks after planting. The emergence of 'Womack', 'Shawnee' and 'Choctaw' was low while 'Cowley' had the highest emergence.

During the growing season many 'Shawnee' plants died and by February, 1993, fewer than ten plants remained in the six replicates. Therefore, these were removed and replaced with 'Lawton'.

The 1992 harvest began on April 22 (Table 3). 'Cowley' was the earliest variety in the test with 48 percent of its production in the first two weeks and over 90 percent of production by May 15. 'Cowley' was also the most productive, yielding over 5,000 lbs. per acre. In addition to being the earliest and highest yielding cultivar, it produced the largest berries (Scott and Lukefahr, 1994). 'Cherokee' reached its peak production during the May 16-26 period when 'Cowley' was essentially finished. 'Cheyenne' reached its peak production even later as 55 percent of total production was between May 27 and June 23.

The bloom count data (Table 4) verified the early flowering of both 'Cowley' and 'Brazos', 'Cherokee', 'Choctaw' and 'Cheyenne' flowered late and flowering rates never approached those of the other varieties. Since these

Table 1. Survival of blackberry cultivars in 1990 screening test. The sixteen cultivars were planted March 8, 1990, and the lower three on April 17, 1990.

	Percent on days after planting			
	30	60	90	120
Navaho	66.6	33.3	33.3	33.3
Black Satin	83.3	83.3	83.3	33.3
Hull	66.6	66.6	33.3	33.3
Shawnee	83.3	83.3	83.3	66.6
Rosborough	100.0	100.0	100.0	100.0
Cheyenne	100.0	100.0	100.0	100.0
Chester	83.3	33.3	0.0	0.0
Thornless Boysenberry	16.6	0.0	0.0	0.0
Austin Dewberry	100.0	66.6	50.0	50.0
Youngberry	0.0	0.0	0.0	0.0
Cherokee	100.0	100.0	100.0	83.3
Lawton	100.0	100.0	100.0	100.0
Darrow	83.3	83.3	66.6	66.6
Silvan	0.0	0.0	0.0	0.0
Brazos (Standard)	100.0	100.0	100.0	100.0
Dawson	66.6	33.3	16.6	16.6
Observation Plots				
Brison	100.0	100.0	83.3	83.3
Cowley	100.0	100.0	100.0	100.0
Choctaw	100.0	83.3	83.3	83.3

Table 2. Emergence of 8 different blackberries after 4,5,6,7 and 8 weeks from root cuttings planted on January 18, 1991. Percentage Plant Emergence

	2/18	2/25	3/4	3/11	3/18
Cherokee	14	37	48	54	61
Rosborough	14	41	48	52	65
Brazos	14	49	55	62	65
Shawnee	5	22	33	32	43
Choctaw	6	21	25	30	33
Womack	8	18	24	29	32
Cheyenne	20	46	58	65	70
Cowley	25	63	78	79	89

Table 3. Harvest data on 7 blackberry varieties on first year production, 1992.

	Percentage of Total Production Harvested Between					Avg. wt. of 20 berries (g)	Quality evaluation ^y
	Total production (kg/ha) ^z	4/22 and 5/4	5/5 and 5/15	5/16 and 5/26	5/27 and 6/2		
Cherokee	2587 cd	16.3	29.2	54.6	0.0	83.0	6
Rosborough	4276 b	8.2	9.1 2	5.7	17.0	86.4	4
Brazos	1270 e	25.7	49.3	21.8	3.2	81.8	2
Choctaw	2597 cd	29.1	55.2	9.8	5.9	99.9	1
Womack	1943 de	12.9	55.9	14.4	16.8	131.9	5
Cheyenne	3014 bc	0.0	20.5	24.5	55.0	104.8	7
Cowley	5965 a	47.9	43.8	8.3	0.0	123.3	3

C.V % 31.75

^z Yields followed by the same letter are not significantly different at the 5% level using LSD test for significance.^y Comparative score based on: Visual evaluation, color, appearance, taste, flavor & texture (1= most desirable).

Table 4. Total number blooms produced on 9.2 linear row meters of 7 blackberry varieties for 7 consecutive weeks at Rio Farms, Inc. 1993.

	Week							Total No. bloom ^{s/d}
	Feb 8-15	Feb 16-22	Feb 23- Mar 1	Mar 2-8	Mar 9-15	Mar 16-22	Mar 23-29	
Cherokee	0	2	5	4	12	143	329	495 c
Rosborough	0	0	2	2	49	169	599	821 b
Brazos	8	26	36	39	248	859	1395	2611 a
Choctaw	0	0	0	0	3	97	458	558 c
Womack	0	6	14	10	6	369	733	1178 b
Cheyenne	0	0	0	0	0	23	102	125 d
Cowley	2	36	45	56	353	893	1395	2780 a

C.V. %

28.03

^d Means followed by the same letter are not significantly different at the 5% level using LSD test for significance.

varieties have a higher chilling requirement and the 1992-93 winter was unusually mild (average minimum air temperature for January 1993 was 10.4 C (50.7°F) and February as 12.6°C (54.6°F), the flowering and berry production was below that measured in 1992.

Table 5 summarizes the yield data for the 1993 growing season. 'Brazos', 'Rosborough' and 'Cowley' did not differ statistically in yield. Only 'Cheyenne' and 'Cherokee' had reduced yields in 1993 compared with 1992. Mean yield in 1993 was 35 percent greater than in 1992.

During the 1992 and 1993 growing seasons, it was not necessary to apply fungicides or insecticides to control pests or diseases on any of the varieties.

DISCUSSION AND CONCLUSIONS

The soils and irrigation water in the lower Rio Grande valley are alkaline but as shown in Tables 1 and 2 several varieties tolerate these conditions and produce good yields (Tables 3 and 5). 'Cowley' shows exceptional promise because of its earliness, fruit size and productivity. While

the origin of this cultivar is uncertain it has been grown in the lower Rio Grande Valley for a number of years (Scott and Lukefahr et al. (1994) this volume).

The early fruiting habits of 'Brazos' and 'Cowley' are desirable as they ripen before production in East and Central Texas begins. This is a distinct advantage in the fresh market 'Cherokee', 'Choctaw' and 'Cheyenne' are vigorous growing plants that produce sweet berries; however, their chilling requirement may limit their usefulness in the lower Rio Grande Valley. By utilizing 'Cowley' 'Cherokee' and 'Cheyenne' fresh berries could be produced for a 60-day period. Since there is no established market for blackberries the marketing of the fresh fruit may be a problem. However, marketing possibilities include "pick-your-own" as well as local supermarkets and restaurants.

LITERATURE CITED

Morris, H.F., Bluefford Hancock, C.F. Garner and Harlan Smith. 1961. Growing Blackberries in Texas. Texas Agr. Exp. Sta. Bull. B-990.

Table 5. Seasonal total blackberry production and percentage of production per week.

Variety	Total kgs/ ha ^d	Weekly percentage of total harvest							
		1 ^e	2	3	4	5	6	7	8
Cherokee	2493 c	0.50	0.60	6.17	10.62	28.54	23.49	18.99	11.06
Rosborough	8719 a	0.37	2.16	8.21	18.50	22.37	8.21	7.54	4.13
Brazos	10481 a	1.35	10.47	22.40	26.07	23.98	12.43	3.14	0.15
Choctaw	3745 bc	0.52	3.65	18.24	28.17	24.88	13.22	7.10	2.60
Womack	4651 b	0.20	5.87	20.66	22.26	27.14	16.57	7.05	0.20
Cheyenne	1851 c	0.00	0.00	1.45	9.82	25.10	25.96	23.39	14.36
Cowley	9958 a	5.31	12.63	22.12	31.54	19.49	6.64	1.56	0.26

^d Means followed by same letter are not significantly different at the 5% level using LSD test for significance.^e Harvest commenced with week 1 on 4/19 and ended on 6/11.