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Blackberry and Dewberry Varieties in East Texas



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Results of a 5-year test of 72 varieties and selections of blackberries and dewberries are presented in this bulletin. Greatest yields were obtained from the varieties maturing from early to mid-season, all having trailing canes. Lawton is the only variety having an erect cane found to be satisfactory. Rogers and Advance bloomed before the last killing frost in the spring, thus producing very low yields. Austin and Lucretia are the best early varieties for commercial planting, while Crandall's Early, Dallas, Early Wonder, Lawton, and Young are recommended commercially from the mid-season group of varieties. All late maturing varieties proved very susceptible to diseases and produced unsatisfactory yields. The Young and Boysen dewberries were outstanding for size and quality of fruit. Of several varieties of the red and black raspberries planted, none proved to be adapted to this section.

CONTENTS

	PAGE
Introduction	5
Commercial Forms	6
Distribution of Production in Texas.....	7
Cultural Methods	8
Methods of Securing and of Computing Data.....	9
Experimental Data	10
Earliness	10
✓Yield	10
Quality	11
Ease of Handling.....	11
Disease Resistance	11
Propagation	12
Raspberries	12
Discussion of Varieties.....	13
Recommendations	29
Literature Cited.....	29

BLACKBERRY AND DEWBERRY VARIETIES IN EAST TEXAS

H. F. Morris, Superintendent, Substation No. 11, Nacogdoches

Both the blackberry and dewberry are native to Texas. Mr. H. B. Parks, Chief of the Division of Apiculture of the Texas Station, who is well acquainted with the flora of the State, has identified 6 species in addition to a number of other forms. According to him these species are as follows: *Rubus argutus* Link, an erect type, armed with slightly recurved prickles, is the most common blackberry of the Piney woods of East Texas. *R. lucidus* Rydb., a very prickly blackberry is found in Central Texas. Of the species having trailing canes, *R. trivialis* Michx. is the most common. *R. rubrisetus* Rydb., a stout much branched dewberry with red-shaggy hairs and broad-based prickles is found in the Brazos Valley. *R. flagellaris* Willd., a large stemmed dewberry, is found in the Lake Caddo country. *R. persistens* Rydb. is found in the Sabine River Valley.

It is realized that there is still considerable confusion in regard to the taxonomy of the genus, and additional work may change the situation materially. There are places in Texas where commercial varieties have been able to establish themselves. It seems likely that a careful research would reveal individual wild plants of merit that could be cultivated with profit. Bailey (2) makes the statement that all of our common varieties of blackberries and dewberries, with the exception of the Oregon Evergreen and the Himalaya, have come from native American species of *Rubus*. *R. trivialis* is a trailing plant common throughout old fields, fence rows, and sparsely timbered areas of East Texas. This type matures during late April to early May, and has one to two fruits per cluster. The berries are medium sized, soft, irregular, and of good quality. The species has been the source of many of our present varieties through the selection of outstanding plants in their native habitat. Most important of these are Rogers, Advance, Manatee, and Chestnut.

Another common type should probably be referred to *R. argutus*. This plant is erect to 5 feet in height, and is found in more choice locations such as alluvial deposits in the mouth of ravines and on fertile open hill-sides. The plants are vigorous, their canes stout and comparatively free of prickles although laterals have a large number of short curved prickles that are of medium size. The fruit is small; there are 3 to 5 berries per cluster, firm, of fair quality, with small seed. The season of ripening is from 10 to 14 days during early June. It is commonly called mayberry. It is probable that the species is one parent of a number of natural blackberry-dewberry hybrids which have been selected and introduced to the trade. The hybrids usually have a vigorous ascending and recurving cane growth, increased size of leaflets and prickles, and larger fruit than the blackberry and of variable size.

Commercial Forms

The commercial varieties under test may readily be divided into three groups. First, there is the dewberry type with prostrate or procumbent trailing canes which must be tied to stakes or placed on wire trellis to assure clean fruit and to aid in the ripening of sound fruit. The fruit often rots when canes are left on the ground, especially during a rainy period early in the spring. Some varieties of this type bloom before the average date of the last killing frost in the spring, thus resulting in the occasional loss of an entire crop. The fruit varies in shape from round to round-oblong, is medium to large in size and black in color, some varieties having jet black berries, and contains many medium sized seeds.

The second type consists of a number of varieties that apparently are hybrids of the blackberry and dewberry. The vigorous primordial canes are erect for the first 4 to 5 feet of growth, then take on a recurving and descending growth later in the season. These canes also require trellising,



FIGURE 1. Lawton Blackberry Comparing Defective Fruits of a Sterile Plant (left) with Fruit of a Normal Plant (right).

as the major portion of the fruit is borne on the laterals of the main stem that touch or are near the ground. The leaflets and prickles are larger than those of the dewberry. The fruit is variable in size within the variety and in general has the appearance of the dewberry, its seed medium to large. One variety, McDonald, has proved to be entirely self-sterile. Darrow and Longley (9) found that certain hybrids when crossed on western forms of the trailing blackberry produced crosses that were nearly or entirely sterile.

The third type is represented by the high-bush blackberry and has semi-erect to erect canes. This is a character that provides greater convenience in the cultural and harvesting operations of a berry plantation. The date of maturity ranges from mid-season to extremely late, a large per cent of the varieties being too late for profitable production in this section. The very late varieties have in general proved to be extremely susceptible to orange rust and nematode, and also to lack vigor in cane growth and laterals. Moreover, these varieties show poor resistance to drouth. Of the number of varieties studied, Lawton alone proved to be sufficiently early, drouth resistant, and productive each season to merit its use for commercial production.

A large number of the varieties studied have shown a varying degree of susceptibility to a form of sterility in the set of fruit. This abnormal condition results in the development of only a few drupelets on the berry as shown in Figure 1. The entire plant may have all "sterile" fruit, or there may be a scattering of the imperfect fruit throughout the normally developed fruit on the same plant. Those plants producing all imperfect fruit one season have the same kind of fruit on the canes arising from the parent stool the succeeding season. The cause is as yet unknown.

Distribution of Production in Texas

According to the information shown in Figure 2 and obtained from the 1930 Census Report of the U. S. Department of Commerce (10), the distribution of blackberry and dewberry production in Texas is centralized primarily in the Northeast Texas Timber Country, the Black Prairie, and the East and West Cross Timber sections. Carter (7) lists these sections as being natural geographic divisions. Smith County in the Northeast Timber country produces approximately 34 per cent of the State's berry crop, where a specialized program of canning and shipping of fresh fruit is carried on with the Lawton and McDonald varieties prevailing. With the recent introduction of several varieties that have a highly desirable quality but have proved to be poor shippers, a centralized production of these varieties near the larger cities is being developed.

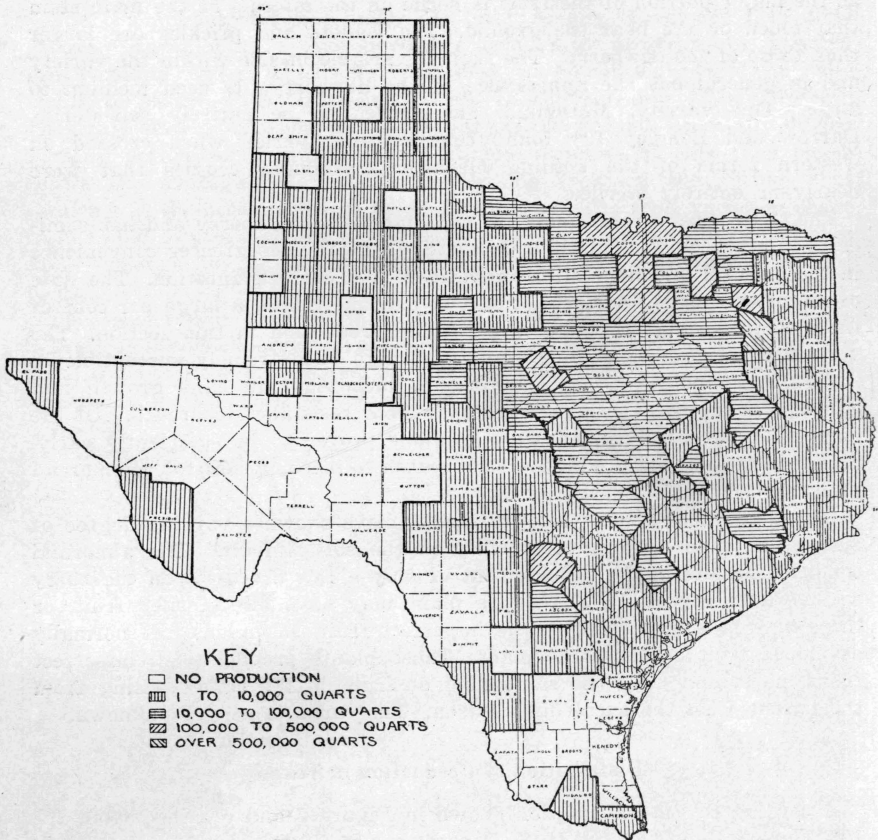


FIGURE 2. Production of Blackberries and Dewberries in Texas According to the 1930 Agricultural Census.

Cultural Methods

The site selected for the test was on a gentle slope with a north to northeast exposure. The soil was typical Kirvin and Ruston fine sandy loams, having a deficiency of organic matter, and also a deficiency of phosphorus and nitrogen. The land is known to have been in cultivation for over fifty years and to have been subject to a rather severe sheet erosion over a portion of the site, but there has been no gullyng on any part of the area. Various cropping systems have been employed during recent years without a regular system of rotation.

Previous to planting the variety test the land was terraced on the contour with a 2 to 3 per cent fall. The rows were laid off parallel to the terrace and spaced 6 feet apart. The soil on which the plantation was located was plowed to a depth of 6 to 8 inches, and disked before the plants were placed

in the rows. The test consisted of 24 one-year-old plants of each variety. They were set by opening a deep furrow and arranging the root-system before soil was placed around the plant with a shovel. Later a cultivation was made for the purpose of filling the furrow. The plants were spaced 4 feet apart in the row. Individual plants were tied to creosoted pine stakes in order to simplify record taking and to reduce damage to the canes during cultivation.

Cultivation has consisted of shallow plowing with shovels and spring tooth harrow. Clean cultivation was the general practice at all times. An application of 600 pounds per acre of a 4-8-4 commercial fertilizer was made in a drill approximately 10 to 12 inches on each side of the plants early in the spring or at the time the earliest variety started blooming.

The primordial canes of each plant were allowed to grow at random until harvest of the current year's crop was completed, at which time the old canes were pruned to the ground, removed from the plantation, and burned. The new cane growth was then tied to the stakes.

As a rule, harvesting began at the time a reasonable amount of the fruit had reached marketable condition, and continued as long as the fruit met the marketing requirements.

Methods of Securing and of Computing Data

The method of procedure employed in securing the data shown in Tables 1, 2, 3, and 4 consisted of recording the yield of fruit for all varieties and strains of these varieties. Along with the yield records, other characters having to do with yield such as the number of clusters per foot of representative fruiting area, the number of berries per cluster, the period of harvesting, and the vigor of plant growth were noted. Furthermore, one outstanding strain of each variety was selected in order to make a detailed study of the vegetative characters for identification purposes. These characters consisted of blooming dates, size and color of the flower, size of sepals, number and size of leaflets, length of petioles and petiolules, length and shape of bracts, and the number, size, and shape of prickles on canes and leaves. Each measurement set forth is the average of a large number of individual measurements made each year the variety was under observation.

A further selection was made of 14 varieties that showed to such an advantage as to be considered of possible commercial importance. These varieties were then studied in detail for characters that determine yield and the quality of canned and fresh fruit, such as the number of new canes from the parent stool, the size of main stem, the number and length of laterals—all important factors having to do with production. The fruit was tasted to determine whether the flavor was mild or approaching strong, and also whether the flavor was acid or sweet. Size of fruit was determined by number of fruits per pint and also by the displacement of water.

Figures on acre yield as presented in Table 2 were computed as follows: pounds per acre were based on a perfect stand of 1815 plants with a

spacing of 6x4 feet. The average yield per plant is the yield per plat divided by the actual number of plants on each plat. The number of crates per acre were calculated by dividing the total acre yield in pounds by 18.1, the weight of the fruit in a 24-pint crate as determined experimentally.

EXPERIMENTAL DATA

Earliness is a desirable character in the selection of a variety, especially in those sections where the grower has to compete with early maturing native plants. Since time for fruit development is about the same for most varieties, those blooming earliest are the first to mature fruit. In general, blooming can be used as a guide to the relative dates of ripening among varieties.

The average date of first and full bloom as shown in Table 1 indicates that three varieties—Advance, Manatee, and Rogers—were the earliest tested. Due to their extreme earliness these varieties are not recommended for this section, as an occasional crop is lost from their habit of blooming before the last average date of killing frost. The varieties Austin, Haupt, McDonald, Lucretia, and Young have a blooming date sufficiently late to escape frost injury and according to data given in Table 2 they are among the first to mature.

A large number of varieties bloom about mid-season, the more important of these being Crandall's Early, Dallas, Early Wonder, Lawton, and Texas Wonder. Dallas, Early Wonder, and Texas Wonder mature their fruit over a three weeks' period, while Crandall's Early and Lawton have a harvesting season of four weeks. All of these varieties in general mature their entire crop before the season of high temperatures and insufficient soil moisture begins.

The varieties which bloom and mature their fruit during the late season are in general represented by a large number of the northern high-bush blackberry varieties. An exception to this is the Himalaya, which is late and has a trailing cane. The high-bush varieties have proved with few exceptions to have a low production, poor plant vigor, and an almost complete susceptibility to the orange rust. The fruit produced usually is of low quality. The variety Blowers appears to be the most successful of the late varieties.

Yield is a character of primary importance in selecting a variety whether for home or commercial use. Of the many varieties studied those maturing during early mid-season and having a cane growth trailing to semi-erect have without an exception been the highest producers. Some of the more important commercial varieties are Austin, Haupt, McDonald, Crandall's Early, and Early Wonder. The Lawton variety, although not so productive as some of the varieties mentioned above, is highly desirable on account of its erect cane growth, while the Young dewberry readily assumes a position of recognized value, both in the home and commercial plantation, due to its excellent quality and large fruit.

The low production of the late maturing varieties is so low as to prohibit

their being grown for commercial production. This is mainly due to lack of vigor in growth of main cane, to the development of only a few short laterals (Table 4), to the set of a small number of fruiting clusters over a representative fruiting area, and to the depredation of birds. On account of the desirable flavor and size of fruit the Blowers is recommended for the home orchard, where an extension of the fruiting season is desired.

The data in Table 2 show that the number of clusters per representative foot of the fruiting area is closely related to the number of berries per cluster. Considering both of these characters together the data show the following general tendency: the earliest maturing varieties have a small number of berries per cluster with many clusters per representative foot of the fruiting area, while the late maturing varieties produce few clusters per representative foot of the fruiting area with a large number of berries per cluster. The midseason group follows this tendency with minor variations. A very significant fact is the close correlation in those varieties adapted to this section between a large number of clusters per representative foot of fruiting area and high yield per plant.

Quality: In determining the quality of the fruit, varieties were rated according to sweetness and degree of flavor, by tasting (Table 4). Sweetness and full flavor are considered desirable, while too little or too much acidity is considered undesirable. The Young and Boysen are considered to have the highest quality of all varieties tested. The Early Harvest proved to be very sweet, but almost lacking in flavor, which results in a flat taste. The Eldorado, Blowers, and Alfred, three later maturing varieties of similar vegetative growth having fruit and seed of approximately the same size, proved to have a close rating and a fairly desirable flavor. The Lawton and Haupt received a rating for acidity that classes them as the least desirable for use as fresh fruit.

Ease of handling the vines is very important for several reasons, viz.: cultivation, harvesting, and staking or trellising. The fact is quickly recognized that an erect cane growth would solve the major portion of these troubles, but unfortunately the Lawton is the only erect variety having a number of desirable characters that is adapted to this section. While several other varieties are highly desirable for either their production, size of fruit, or quality, all of these have either trailing or semi-erect cane growth. Therefore the canes must be either tied to stakes or placed on a wire trellis in order to facilitate ease of cultivation and harvest, and to insure a supply of clean fruit. The most important factors in determining whether or not the canes of a variety are easily handled are the type, size, and number of prickles on canes and leaves.

Disease resistance should be an important consideration in the selection of any variety as this trait will reduce the cost of a spraying program and make unnecessary the removal of plants infected with orange rust, a disease that cannot be controlled by fungicides.

As previously mentioned nearly all of the late maturing varieties of the high-bush type of blackberry are susceptible to orange rust infection.

Most varieties are susceptible to the leaf spot disease, which can be controlled by Bordeaux mixture. The Lawton, Kenoyer, Manatee, Robinson, and Ozark Beauty appear to be affected more by leaf spot than other varieties studied.

Anthraxnose was prevalent on a number of varieties, the greatest damage being noted on the Young, Boysen, Loganberry, and several types of Thornless.

A recent infection of rosette was heaviest on the Lucretia, Young, several types of Thornless, and the Boysen. Plakidas (14) states that a carefully planned program of pruning and spraying with Bordeaux will control the disease.

The studies at this Station have not shown a variety that is resistant to all diseases. Therefore the grower should bear in mind that it is essential to carry out a conservative spray program each season.

Propagation: The securing of plants from the dew or blackberry for increase plantings is not a difficult matter since root cuttings, tip-rooted cuttings, and possibly leaf-bud cuttings are recognized methods of propagation.

In the case of the blackberry, the simplest means of propagation is to use sucker canes that come from the roots at various distances from the parent plant, and also from the roots that have been cut. Perhaps the greatest success can be had from using roots of $\frac{1}{4}$ inch or more in diameter cut in pieces 5 to 8 inches in length.

The dewberry can be propagated readily by both the tip-layering and root-cutting methods. Most hybrids of the blackberry and dewberry can also be propagated by both methods.

Stoutemyer, Maney, and Pickett (16) have reported a rapid method of propagating raspberries and blackberries by leaf-bud cuttings. It is possible that propagation of the dewberry can be made in this way, but no such work has been reported.

Raspberries

A number of varieties of the red and black-cap raspberries were included in the varietal plantation for the purpose of studying their response to climatic and soil conditions in East Texas, and to furnish a source of material for combining the desirable raspberry flavor with certain desirable varieties of the blackberry.

All of the varieties in general had a poor vigor of plant growth and a high percentage of mortality of plants that resulted from long periods of high temperatures and low rainfall during the summer months. The plants were very susceptible to the disease anthracnose. The few fruit that set developed into a very dry, seedy berry of poor quality, maturing along with the late blackberries. The Van Fleet variety proved to be the most hardy of the lot studied.

DISCUSSION OF VARIETIES

Advance closely resembles the Rogers. It is an extra early variety for this section (Table 1). It is usually in full bloom a week after the last average date of killing frost in the spring. Cane growth is vigorous, trailing, and reasonably free from disease. It is very productive when the yield is not reduced by late frosts. The fruit and seed are of medium size, with one fruit per cluster. A few plants should be included in the home orchard for early fruit. It has commercial possibilities near the coast and South Texas. In a letter dated November 22, 1934, Darrow states, "We have also suspected the Advance, which is grown extensively by Mr. Knott and by the Japanese nearby, to be the same as the Rogers. Certainly it came originally from Texas."

On the other hand, Mr. E. Mortensen has grown both varieties at Texas Substation No. 19 in the Winter Garden area and considers them to be distinct, although similar varieties. Under his conditions berries of Advance are much firmer than those of the Rogers.

Alfred is semi-erect with primordial canes erect during the first season. It is a shy bearer and very late, ripening during June. Fruit is medium to large, of extra good quality, with 7 to 8 per cluster on tip of laterals. The seeds are large. This variety is very susceptible to orange rust and to nematode. As is the case with all late varieties studied, satisfactory yields were not obtained due to the heat and drouth usually prevailing during the latter part of June. This variety was found as a chance seedling near Alfred, Michigan, in 1917 by George Stromer (8).

✓ **Austin** is also called Austin's Improved, Austin-Mayes, and Mayes. A vigorous trailing variety, it puts out an average of three new canes per plant each season. The laterals are above those of the average dewberry variety in number and length. Its season is extra early, but late enough to escape frost injury: The berries are comparatively small, too soft for long distance shipping, of good quality, with a seed of medium size. It is a very heavy yielder, with 4 to 8 fruits per cluster, the clusters being well distributed over the plant. The white blooms are of medium size. The slightly hooked prickles are fewer on the leaves and canes than on most varieties. It is somewhat susceptible to leaf spot and anthracnose, but is considered to be otherwise free of disease. The Austin is recommended for early fruit for local markets.

Badger is very late, maturing its fruit the latter part of June, continuing into July. Due to lateness, its yield of fruit and quality are low. Plant growth is semi-erect, not vigorous. There are as many as 15 berries per cluster, set on the extreme tip of the lateral growth. It is very susceptible to orange rust and to nematode.

Best of All. See Early Harvest.

Table 1. Flower Characters

Variety	Blooming dates		Flowers		Sepals*	
	First	Full	Diameter (mm.)	Color	Length	Width
Advance	3/9	3/19	42.60	white	6.20	3.31
Alfred	4/15	5/1	39.47	white	8.72	4.51
Austin's Improved	3/22	4/5	30.30	white	6.72	3.99
Austin Mayes	3/20	4/2	37.48	white	7.13	4.31
Badger	4/23	5/20	25.00	white	6.70	4.00
Blackberry-Dewberry Hybrid	3/24	4/1	38.59	pink-white	7.57	3.9
Blowers	4/19	5/8	41.00	white	8.32	4.68
Boysen Berry	4/1	4/10	38.90	white	17.40	11.50
Chestnut	3/18	3/29	36.34	pink	6.86	4.05
Cory's Thornless	4/8	4/19	†			
Crandall's Early	3/29	4/10	41.03	white	7.78	4.37
Crystal White	4/9	4/22	30.40	white	5.43	3.00
Dallas	3/30	4/11	39.48	white	6.89	4.00
Early Harvest	4/5	4/17	31.38	pink-white	5.66	2.87
Early King	4/16	4/22	40.28	white	6.10	4.44
Early Wonder	3/26	4/7	39.44	white	6.63	4.30
Eldorado	4/13	5/1	38.27	white	8.57	4.42
Evergreen	5/8	5/21	43.36	pink	20.24	10.13
Gardena	3/27	4/6	31.44	white	6.96	4.26
Haupt	3/20	4/1	35.73	white	6.22	3.50
Himalaya	5/2	5/26	36.60	pink	11.46	6.18
Iceberg	4/8	4/19	31.10	white	5.81	3.15
Jordan	4/1	4/14	38.42	white	7.78	4.12
Joy	4/16	5/1	38.76	white	9.31	4.69
Kenoyer	4/3	4/16	36.38	pink-white	6.95	4.08
Lagrange	4/17	5/3	39.90	white	6.92	4.75
Lawton	3/27	4/10	40.55	white	6.20	4.55
Loganberry	4/2	4/17	†			
Louisiana Selection No. 2	3/16	3/25	39.53	white	7.26	4.71
Macatawa	4/15	5/3	38.38	white	11.91	4.96
Macatawa	3/29	4/6	34.16	white	8.94	4.18
Mammoth	4/5	4/17	39.04	white	9.02	5.38
Manatee	3/13	3/26	39.05	white	10.00	3.60
Marvel	4/19	5/6	41.66	white	8.96	4.61
McDonald	3/24	4/4	33.76	white	6.37	3.91
Mersereau	4/17	5/10	39.80	white	9.15	4.81
Mount Pocono	4/20	5/2	41.18	white	9.46	4.66
Native	3/28	4/12	31.06	white	5.06	2.97
Native (Rosborough)	3/27	4/7	41.70	white	6.66	4.56
Ozark Beauty	3/26	4/8	37.38	white	6.20	4.21
Pink Blackberry	3/21	4/6	26.72	white	5.24	2.96
Rathbun	4/4	4/16	29.01	pink-white	5.28	3.06
Robinson	3/27	4/11	39.65	white	6.42	4.20
Rogers	3/9	3/22	38.02	white	6.87	3.55
Russell or Best of All	4/1	4/16	27.77	pink	5.30	2.98
Snyder	5/3	5/16	36.20	white	12.12	4.84
Special	3/22	4/2	39.36	pink-white	7.02	3.86
Star of Wonder	5/7	5/20	26.10	pink	17.14	10.32
Stones Hardy	4/27	5/15	29.10	white	8.38	4.88
Taylor	4/19	4/23	37.84	white	6.66	4.46
Texas Wonder	3/29	4/6	36.52	white	6.10	3.82
Thornless	3/29	4/8	41.10	white	7.72	4.06
Thornless-Austin	4/1	4/6	41.16	white	7.84	3.70
Ward	4/13	4/30	38.11	white	8.24	4.47
Young Dewberry	3/31	4/15	39.14	white	10.31	6.17

*All sepals were found to be lanceolate in shape.

†Flowers used in breeding work, no records obtained.

Blackberry-Dewberry Hybrid is an extra vigorous selection having a procumbent to trailing cane growth, with many unusually long laterals. Further selection is needed as the plants are variable. The berries set early, 3 to 4 in a cluster, giving a very heavy production. The fruit is of medium size and somewhat variable, quality fair, firmness fair to good, seed medium to large. Many curved prickles are on the foliage and canes. It was originated and introduced by the Cistern Nursery at Flatonia, Texas.

Blowers is an erect variety, late for this section. The medium to large fruit possesses excellent quality when fully ripe, setting 8 to 10 fruit per cluster, at the tips of the lateral growth. Plant growth has fair vigor, but is very susceptible to orange rust and to nematode.

Boysen is a trailing variety possessing the cane, foliage, and prickly characteristics of the Young dewberry (Figure 3). Vigor is poor to fair,

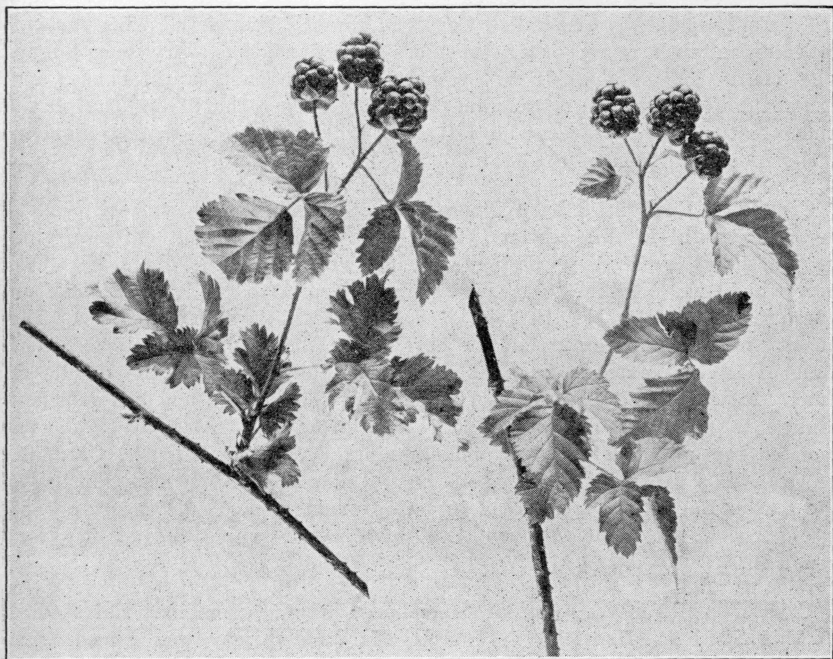


FIGURE 3. Young Dewberry (left), Boysen (right) Illustrating Similarity of Fruiting Habit.

making it a shy bearer. It is susceptible to rosette, leaf spot, and anthracnose. The blooming dates are the same as for the Young, but it starts maturing fruit a week to ten days later, or about the middle of May. The extra large fruit has a reddish-purple cast, is slightly elongated, and is too soft for long distance shipping. The flavor of the fruit is excellent.

The seeds are extra large. It is desirable for the fancy pack trade on local markets. It was developed by Rudolph Boysen, Anaheim, California, who states in correspondence, "The Boysen berry was the result of one of several experiments. On the blossom of a very fine Himalaya blackberry, I dusted the pollen of a raspberry, a loganberry, a dewberry, and a strawberry. Of course I do not know which ones took but it was a good combination."

Brainerd as grown in our tests has proved to be the Himalaya, according to identification made by Darrow from fruit and vegetative material supplied. We therefore have no information on this variety.

Chestnut is an early variety with trailing main stem and laterals. The weak plant is susceptible to leaf spot and anthracnose. It has a medium size, fairly firm fruit, and an average of two berries per cluster.

Cory's Thornless is also called Cory's Mammoth Thornless. This variety, in common with many other thornless selections, has very poor vigor. The plants are susceptible to orange rust, leaf spot, anthracnose, and sun-scald. The few fruits reaching maturity during the life of the plants under test were very sweet and soft, and had large seed. It originated as a thornless mutation of the Mammoth (5).

Crandall's Early is a hardy, vigorous, early mid-season variety that is very successful in this section. Plants have an ascending and recurving growth habit, with three new canes each year from the old stool. The berry is black, medium to large, setting 5 fruits to the cluster, with an average of 9 clusters to the foot over a representative fruiting area. The quality is excellent, texture of the berry firm, the seed medium-sized. The time of harvest extends from about the middle of May to the middle of June. It has proved to be free of diseases in this section and has sufficient foliage to protect cane growth and fruit from sun-scald. It is recommended for both local market and shipping. Card (6) lists the Crandall, or Crandall's Early, as synonymous with Texas Early. Hedrick (11) says the Texas Early was introduced into California from Texas prior to 1885 by Dr. J. R. Crandall, Auburn, California, after whom the variety was renamed.

Crystal White is very similar to Iceberg, judging from material studied at this Station. Hedrick (11) states that the variety was raised from seed by John B. Orange, Albion, Illinois, prior to 1859, while he considers Iceberg to be the result of three generations of crossing Lawton and Crystal White by Luther Burbank, who introduced it in 1879. The plant growth is upright, vigor fair to good, resistance to drouth low, prickles few and weak, maturing date mid-season. The fruit is medium to small, of a dull amber-white color, soft, sweet, with only fair quality. It is not recommended for market because of appearance and the mushy condition of the packed product.

Table 2. Fruit Characters

Variety	Years in test	Date fruiting season		No. clusters per foot of cane	No. berries per cluster	Color ripe fruit	Yield of fruit per acre*		Vigor	Habit of growth	General Notes
		First ripe	Last harvest				Pounds	Crates			
Advance.....	2	4/22	5/19	10.0	1.0	black	1724	95	very good	procumbent	early
Alfred.....	5	6/3	6/29	6.9	7.8	black	962	53	fair	a. & r. † to erect	late, large
Austin.....	5	5/1	5/27	11.2	3.6	black	8004	442	good	procumbent	early
Austin Improved.....	5	4/29	5/28	11.1	4.4	black	7641	422	very good	procumbent	
Austin Mayes.....	5	5/1	5/29	8.7	3.3	black	6116	338	good	procumbent	
Badger.....	2	6/18	7/3	5.4	14.6	black	109	6	poor	semi-erect	late
Blackberry-Dewberry Hybrid.....	3	5/5	6/12	9.8	3.4	black	7732	427	excellent	procumbent	
Blowers.....	3	5/31	7/2	7.5	8.0	black	1325	74	fair	erect	late, large, good flavor
Boysen.....	1	5/17	6/3	4.4	1.9	reddish-purple	54	3	poor	procumbent	
Chestnut.....	4	5/1	5/27	8.9	2.0	black	3176	175	poor	procumbent	
Cory's Thornless.....		5/14	†							procumbent	shy bearer
Crandall's Early.....	5	5/18	6/19	9.4	5.0	black	5917	327	very good	a. & r.	prolific, large
Crystal White.....	2	5/19	6/7	10.4	7.3	amber-white	182	10	good	erect	amber-white fruit
Dallas.....	5	5/17	6/12	10.2	4.1	black	3775	208	very good	a. & r.	excellent flavor
Early Harvest.....	5	5/16	6/21	11.8	8.5	black	2269	125	good	erect	prolific, small
Early Harvest.....	3	5/30	6/30	9.1	8.5	black	799	44	fair	a. & r.	
Early Harvest.....	2	5/16	6/10	11.5	7.7	black	889	49	good	erect	
Early King.....	2	5/22	6/24	7.3	5.3	black	472	26	good	a. & r.	whitish pubescence on cane
Early Wonder.....	4	5/14	6/9	9.5	4.4	black	5155	285	very good	a. & r.	
Eldorado.....	3	6/5	7/5	5.1	11.0	black	182	10	poor	semi-erect	late
Eldorado.....	5	6/3	6/29	7.2	7.7	black	744	41	fair	semi-erect	late
Eldorado.....	2	6/3	6/23	6.3	6.5	black	327	18	poor	semi-erect	
Evergreen.....		6/30	†							procumbent	extra long sepals
Gardena.....	1	5/18	5/27	5.8	3.0	black	1543	85	fair	procumbent	
Halls Lawton.....	5	5/19	6/19	10.5	3.9	black	5372	297	very good	erect	prolific, fruit large
Halls Lawton (selfs).....	3	5/14	6/9	9.8	4.3	black	3612	200	very good	a. & r.	
Haupt.....	5	5/6	6/2	11.5	4.3	black	7605	420	very good	a. & r.	early, extra prolific
Himalaya.....	2	6/9	6/29	12.9	19.4	black	472	26	excellent	a. & r.	shy bearer
Iceberg.....	3	5/14	6/11	10.1	7.5	amber-white	1960	108	fair	erect, a. & r.	amber-white fruit
Jordan.....	3	5/17	6/14	9.1	4.1	black	3067	169	good	a. & r.	
Joy.....	2	5/31	7/1	8.6	7.1	black	980	54	poor	a. & r.	
Kenoyer.....	5	5/14	6/8	10.7	5.2	black	2178	120	good	erect	short fruiting season
Lagrange.....	3	5/30	6/25	7.0	6.6	black	472	26	poor	semi-erect	
Louisiana No. 2.....	5	4/29	5/30	8.1	1.6	black	3249	179	very good	procumbent	very prickley
Lucretia.....	2	5/14	6/5	6.8	3.0	black	1398	77	poor	procumbent	
Lucretia.....	3	5/14	6/8	6.8	3.5	black	1071	59	poor	procumbent	
Lucretia.....	5	5/5	6/3	8.1	3.8	black	4120	228	fair	procumbent	early, large seed
Macatawa.....	2	5/31	7/1	8.4	7.4	black	1561	86	fair	a. & r.	
Macatawa.....	4	6/2	6/26	4.3	12.6	black	290	16	fair	a. & r.	late
Macatawa.....	1	5/19	6/15	6.2	6.3	black	2124	117	good		

Table 2. Fruit Characters—Continued

Variety	Years in test	Date fruiting season		No. clusters per foot of cane	No. berries per cluster	Color ripe fruit	Yield of fruit per		Vigor	Habit of growth	General Notes
		First ripe	Last harvest				Pounds	Crates			
Mammoth	1	5/12	6/5	6.4	3.1	black	908	50	poor	procumbent	
Manatee	3	4/22	5/21	7.3	2.3	black	3212	177	fair	procumbent	
Marvel	3	6/2	7/5	7.8	7.9	black	980	54	fair	semi-erect	fruit matures unevenly
McDonald	5	4/30	5/28	11.3	4.0	black	7568	418	very good	procumbent	early, self-sterile
McDonald	4	4/30	5/27	11.5	3.9	black	7841	433	good	a. & r.	long fruit spur
Mersereau	3	6/1	7/2	7.3	8.7	black	1325	73	poor	erect	late
Mersereau	2	5/28	6/30	7.4	7.9	black	653	36	poor	erect	
Mount Pocono	2	6/1	7/1	8.2	7.3	black	1107	61	poor	a. & r.	
Native	5	5/20	6/19	13.0	6.7	black	2142	118	very good	erect	late, small seed
Native	2	5/14	6/5	10.5	4.5	black	4792	265	excellent	a. & r.	large per cent of partially developed fruit
Ozark Beauty	2	5/26	6/18	9.1	4.2	black	1525	84	poor	erect	
Pink Blackberry	2	5/4	6/12	12.8	3.8	pink	4519	250	good	a. & r.	light green canes
Rathbun	5	5/14	6/19	11.9	7.4	black	3430	190	good	erect, a. & r.	heavy bearer, small fruit
Robinson	3	5/22	6/22	10.0	4.2	black	2160	119	very good	erect	
Rogers	5	4/19	5/22	8.5	1.7	black	1978	109	good	procumbent	shy bearer, early blooming
Russell or Best of All	4	5/14	6/15	13.0	6.6	black	2178	120	good	erect, a. & r.	
Snyder	1	6/18	6/27	6.2	13.9	black	200	11	fair	erect	late
Snyder	2	6/5	6/29	4.7	15.1	black	417	23	poor	erect	poorly developed fruit
Snyder	2	5/29	6/29	10.0	7.8	black	1016	56	fair	erect	late
Special	3	5/12	6/4	10.4	3.5	black	4973	275	excellent	a. & r.	
Star or Wonder		6/30	†						very poor	procumbent	extra large sepals
Stones Hardy	1	6/20	7/6	6.9	17.1	black	163	9	poor	poorly developed fruit	
Taylor	2	5/31	6/29	10.0	6.1	black	581	32	poor	semi-erect	late
Texas Wonder	1	5/18	6/4	7.2	3.4	black	1797	99	good	a. & r.	
Thornless	4	5/13	6/1	7.3	3.3	black	1180	65	poor	procumbent	
Thornless	3	5/7	6/2	7.7	3.5	black	1053	58	poor	procumbent	
Ward	4	5/31	6/24	6.0	6.6	black	672	37	fair	erect	
Young Dewberry	5	5/6	6/5	6.3	3.6	reddish-purple	3684	204	good	procumbent	extra large fruit of excellent flavor
Young Dewberry	2	5/11	6/3	6.4	3.1	reddish-purple	2414	133	good	procumbent	Do.
Young Dewberry	3	5/9	6/2	7.0	3.7	reddish-purple	1942	107	good	procumbent	Do.

*Based on a perfect stand of 1815 plants per acre.

†Plants became infected with orange rust before data were obtained.

‡Ascending and recurving.

Dallas has a semi-erect, vigorous plant growth, with an average of 6 new canes each season from the parent stool, each of which averages 9 laterals per cane, that average 82 cm. long (32 inches). The 3 to 5 leaflets are of medium size. The prickles are curved and shorter on the leaf and cane than in most varieties. Flowers are white and rather large. The fruiting season is medium, lasting about three weeks. The 10 clusters per foot of representative fruiting area have 4 fruits each. The berry is black, somewhat less than medium size, texture firm, quality excellent, with a seed of medium size. Its heavy yields, resistance to disease, and firm fruit of excellent quality make this variety desirable in the berry plantation for both home consumption and marketing. It originated in Texas prior to 1886, and is said to be a blackberry-dewberry hybrid (11).

Early Harvest: Material received under the name of Best of All, Rathbun, and Russell proved to be identical to this variety. It is an erect variety with a fairly vigorous plant. The foliage is thin and small, insufficient to protect the fruit and cane from sun-scald. The very small fruit ripening in mid-season is of good quality and has the smallest seed of any variety studied, which makes it excellent for home use in preserves and canning. Early Harvest has a tendency to set more fruit than the plant can properly mature. It is susceptible to leaf spot and orange rust.

Early King is a medium late variety with ascending and recurving cane growth of good vigor. The fruit clusters set on the tips of lateral growth with 5 fruits per cluster. Owing to lateness the yields are low, but the quality is fair. The berries are of medium size. This variety is susceptible to orange rust and to nematode.

Early Wonder is vigorous, early to mid-season, its fruit maturing in a three weeks' period. Plant growth, ascending and recurving, consists of 2 to 4 new canes from the parent stool with 14 laterals per plant averaging 112 cm. (44 inches) in length. There are 5 leaflets per leaf of average size. It has fewer prickles on leaf and cane than most varieties. It starts blooming during the latter part of March, the large white flowers having medium lanceolate sepals. The berries are medium to large, black, firm, of excellent quality; they make a very attractive appearance both on the plant and in the pack. Yields are heavy as it is productive and matures a full crop. The seeds are of medium size. It is recommended for both home consumption and marketing. Hedrick (11) writes that the variety was found about 1902 by the Fitzgerald Nurseries, Stephenville, Texas, by whom it was introduced about 1910.

Eldorado is a late variety for this section with only fairly vigorous erect plant growth. It is subject to orange rust and to nematode. The fruit is of medium size, of fair quality, and sets in clusters of 11 berries on the tips of lateral growth. It is a poor producer.

Evergreen or Oregon Evergreen is a very late variety, starting to bloom the early part of May and maturing fruit the first of July. It remains evergreen throughout the winter, and shows splendid vigor in the growth

Table 3. Plant Characters

Variety	Number leaflets to leaf	Size of leaflets		Length of petioles (cm.)	Length of petiolules (cm.)	Length of bracts † (cm.)	Prickles on leaves		Prickles on canes		
		Length (cm.)	Width (cm.)				Number	Length (mm.)	Number per inch	Length (mm.)	Shape
Advance.....	5.00	5.74	2.37	6.49	1.98	9.20	95.40	1.8	10.9	4.9	straight
Alfred.....	4.77	8.94	4.99	6.70	2.40	12.17	45.93	1.8	4.11	6.8	curved
Austin's Improved.....	4.96	7.05	3.31	5.08	1.82	10.22	44.28	1.8	6.59	4.7	curved
Austin Mayes.....	4.64	5.94	2.80	3.48	1.10	9.05	29.36	1.2	8.60	4.5	hooked
Badger.....	3.40	9.43	6.62	6.29	1.97	13.47	49.06	1.6	4.09	7.1	straight †
Blackberry-Dewberry Hybrid.....	4.72	7.95	4.00	5.22	1.97	12.29	56.88	1.93	11.60	5.2	curved
Blowers.....	4.68	8.43	4.84	5.94	2.18	11.72	43.00	1.64	4.34	6.6	straight †
Boysen.....	3.90	7.05	5.30	5.74	2.66	1.44	74.00	2.2	18.70	5.1	curved
Chestnut.....	4.66	5.00	2.33	5.66	1.55	7.10	46.39	1.7	11.48	3.7	curved
Cory's Thornless.....	3.03	9.48	5.52	4.27	1.66	1.85*	9.40	.8	0.0	0.0	curved
Crandall's Early.....	4.80	7.79	4.03	5.34	2.13	10.09	40.98	1.8	7.78	5.9	curved
Crystal White.....	4.91	7.80	3.03	5.48	1.77	14.12	26.35	1.6	4.05	4.7	straight †
Dallas.....	4.72	7.18	4.26	6.78	2.52	11.08	45.37	1.9	6.60	6.2	curved
Early Harvest.....	4.66	7.31	3.61	5.32	2.21	11.76	19.92	1.3	3.14	4.7	straight
Early King.....	4.67	7.27	4.70	5.63	1.66	12.22	56.22	2.0	9.88	4.5	curved
Early Wonder.....	4.95	6.85	4.06	5.72	2.01	10.62	34.86	1.9	7.40	5.5	straight †
Eldorado.....	4.69	8.44	5.01	6.63	2.47	11.56	44.08	1.9	3.90	6.5	straight †
Evergreen.....	4.76	5.73	5.84	6.26	2.60	9.54	110.84	2.6	7.32	5.6	curved
Gardena.....	5.00	6.93	4.02	6.72	2.20	10.40	25.00	1.8	7.10	3.5	curved
Hall's Lawton.....	4.97	7.43	4.02	5.94	1.79	11.47	30.58	2.4	6.59	7.5	curved
Haupt.....	4.78	6.93	3.62	5.21	1.76	10.68	65.05	1.7	14.80	5.0	curved
Himalaya.....	4.88	8.10	5.14	6.44	2.96	13.88	75.28	3.6	8.32	8.3	straight and curved
Iceberg.....	5.00	8.11	2.97	7.17	2.61	16.85	24.73	1.6	2.87	4.1	slightly curved
Jordan.....	4.98	6.79	3.86	5.89	2.27	10.50	50.58	2.0	8.90	6.4	straight
Joy.....	4.93	8.56	4.92	6.93	2.63	12.44	51.81	2.2	3.11	6.0	straight
Kenoyer.....	4.90	7.85	4.94	6.43	3.03	13.33	28.05	1.9	2.90	5.2	curved
Lagrange.....	4.93	7.41	4.71	6.61	1.96	12.12	58.75	2.4	7.75	4.5	very slightly curved
Loganberry.....	3.00	5.08	4.63	3.42	1.05	9.84	95.12	3.6	22.50	3.0	straight
Louisiana No. 2.....	4.99	6.07	2.93	6.34	1.83	9.11	112.51	2.1	32.58	4.86	straight
Lucretia.....	4.92	7.29	4.52	6.77	2.44	15.50	39.76	1.7	8.20	3.36	slightly curved
Macatawa.....	5.00	7.11	3.40	5.98	2.32	7.2	24.00	1.6	10.20	4.70	curved
Mammoth.....	3.00	7.87	4.94	3.55	1.27	12.30	83.70	3.6	60.10	6.70	straight
Manatee.....	4.82	7.39	3.36	5.21	1.73	7.98	75.38	2.3	14.14	4.23	curved
Marvel.....	4.80	9.05	5.03	7.79	2.89	12.87	52.89	2.2	2.77	6.40	straight
McDonald.....	4.82	6.18	2.94	4.07	1.30	9.14	38.29	1.3	8.00	4.8	curved
Mersereau.....	4.70	8.05	4.52	5.86	2.03	11.95	42.35	1.7	3.61	6.8	straight
Mount Pocono.....	4.70	8.17	4.58	6.90	2.41	11.89	42.81	2.2	3.51	6.5	straight
Native No. 1.....	4.92	7.38	3.66	5.94	3.00	14.01	46.70	1.7	4.60	5.7	straight †
Native No. 23.....	4.98	8.83	4.58	7.48	2.42	12.50	69.86	3.1	10.40	7.3	straight
Ozark Beauty.....	4.96	5.69	2.99	3.53	1.06	9.14	60.60	2.9	5.50	6.3	straight
Pink Blackberry.....	4.97	6.47	3.40	5.39	2.06	10.19	47.65	1.7	8.46	4.2	curved

Rathbun.....	4.65	6.90	3.73	5.17	2.36	10.14	19.16	1.3	3.50	4.4	slightly curved
Robinson.....	4.99	7.75	4.12	6.68	2.23	13.34	37.49	2.7	6.32	7.3	straight
Rogers.....	4.97	6.69	3.35	7.80	2.02	9.83	62.17	1.6	8.00	4.3	sharply curved
Russell's.....	4.71	6.51	3.56	4.95	2.30	9.54	19.19	1.2	4.07	4.3	straight †
Snyder.....	4.52	10.83	8.09	7.19	3.49	14.78	30.10	2.1	2.35	7.2	straight †
Special.....	4.52	6.45	3.13	4.46	1.47	9.77	48.06	1.9	16.70	5.5	curved
Star.....	4.44	4.26	4.81	5.24	2.05	9.96	90.52	2.7	9.76	4.6	hooked
Stone's Hardy.....	4.13	9.55	6.53	7.25	3.22	13.42	62.80	2.8	4.27	7.3	straight
Taylor.....	4.66	7.55	4.69	5.90	1.74	12.96	56.38	1.8	8.32	5.0	curved
Texas Wonder.....	4.94	6.65	2.57	6.40	2.02	10.40	16.00	1.1	7.70	5.7	curved
Thornless.....	4.68	5.79	3.26	5.31	1.57	3.16	0.00	0.0	0.0	0.0	
Thornless Austin.....	4.00	5.33	3.43	3.83	.79	2.08	0.00	0.0	0.0	0.0	
Ward.....	4.84	8.32	4.63	6.30	2.20	10.64	38.36	1.9	4.10	5.6	St. to very sl. curved
Young.....	4.54	8.06	5.32	6.33	2.84	18.77	54.69	2.5	18.50	4.4	curved

*Some leaves do not have bracts.

†Straight to very slightly curved.

‡From J. R. Rosborough, College Station.

¶All bracts were found to be lanceolate in shape.

of new canes, but does not yield because of poor fruit bud development and because of rosette. It is also very susceptible to anthracnose, orange rust, and sun-scald. The flowers are large, pink and white, with pink tips. The sepals are unusually long. It has 5 leaflets per leaf, each leaflet being cut-leaf or deeply serrated. Hedrick (11) states, "There is no question but that the Oregon Evergreen came originally from the Old World, and that it is a form of the common European blackberry *Rubus laciniatus*. Introduced into Oregon from some of the South Sea Islands at an early date in the history of Oregon."

Gardena is a medium early variety. The fairly vigorous, trailing cane growth and foliage are similar to the Lucretia, but it fruits two weeks later than the Lucretia. The berries are medium to large, long, and of good quality, but are inclined to be soft when fully matured on the plant. It has not been in the test long enough to allow an accurate check on its production. This variety is of western origin, named from Gardena, California. It is supposed to be a seedling of Premo (11).

Haupt is one of the most productive varieties, being very vigorous. The canes are ascending and recurving the second season; 4 to 5 new canes grow from the parent stool, with an average of 16 laterals per cane; the average lateral measuring 136 cm. (53 inches). The curved prickles on cane and foliage are above the average in number and less than the average length. There are 4 to 5 leaflets per leaf, each one smaller than the average leaflet. The medium-sized white flowers appear during the latter part of March. The fruit ripens from early May to the first of June. The berries are borne 6 to the cluster, with 11 to 12 clusters per representative foot of fruiting area, thus making the variety very productive. The berry is of medium size, seed medium to large, quality fair, fairly firm, jet black during early part of harvest but dingy brown during the latter part of the harvest due to sun-scald. It is susceptible to leaf spot. It was found growing wild in Wharton County, Texas, by Colonel W. W. Haupt, Kyle, Texas, about 1898, and introduced a few years later by the Austin Nursery Company, Austin, Texas. It is considered a cross between a dewberry and a blackberry (11).

Himalaya has more vigor than any variety studied, new canes reaching lengths of 20 to 30 feet. It is not productive in this section because of lateness. The berries are of medium size and of fair flavor. The seeds are large. The fruit is borne 19 to 20 in the cluster. The prickles are straight or curved, with the greatest length of any variety studied. The leaves bear a number of prickles much above the average, while the cane has fewer than the average. It is a representative of the European blackberry, *Rubus procerus* P. J. Muell, having been introduced by Luther Burbank about 1889 (3, 11).

Iceberg. See Crystal White.

Jordan apparently is a selection of Crandall's Early. It is a mid-season variety with vigorous cane growth, evidently free of disease, and fairly

productive. The black fruit are of medium size and good quality. It is listed by Bailey (2) as belonging to the *Rubus velox* group. Material studied at this Station under the name of Jordan has proved to be identical to Crandall's Early, although Hedrick (11) quotes the Austin Nursery Company, Austin, Texas, as writing that the variety originated about 1895 with James Nimon, Denison, Texas, who later introduced it.

Joy has poor vigor, low yields, and a susceptibility to orange rust and leaf spot. The cane growth is ascending and recurving. It ripens late. The berries are of medium size, firm, of fair quality, with medium to large seed.

Kenoyer is an erect variety with good plant vigor. It is fairly productive for the first three years in the plantation; after that, vigor and yields begin to decline. New plantings should be made every fourth year. This additional expense is justified by the excellent flavor of the black, medium-sized fruits which mature at mid-season. The seeds are medium in size. Its habit of setting its clusters in a concentrated area well toward the tips of the lateral branches makes it one of the easiest varieties to harvest. There are 5 medium-sized leaflets to the leaf. The rather short curved prickles are scarce on cane and foliage. The firm fruit makes an attractive pack. It is recommended for home consumption and marketing.

Lagrange is a late semi-erect variety lacking vigor and productivity. It is susceptible to nematode and orange rust. The fruit is black, of medium size, fair quality, with medium to large seed. The prickles on cane and foliage are curved, of average number and length.

Lawton is an erect variety with extra good plant vigor and of medium maturity. The plants are very productive. It sprouts easily from the cuttings, and tends to produce a large number of new sprouts when roots are cut by deep cultivation. It is an unusually vigorous sort, the parent stool, under very favorable conditions, producing up to 7 new canes each season. There are many laterals from 2 to 3 feet in length. There are 5 leaflets per leaf of medium size. The prickles are fewer than the average on cane and leaf, but the curved prickles are longer than the average in each instance. The large white blooms appear the latter part of March. The harvest extends from around May 19 to June 19 (Table 2). It is very productive, there being as many as 12 clusters of 5 berries each per foot of representative fruiting area (Figure 1). The fruit is medium to large, acid until fully matured, firm, of good quality, with large to medium seed. Its erect cane growth, resistance to disease, productiveness, drouth resistance, and large firm fruit are characters which make this variety desirable for home consumption and shipping. Found by William Lawton, New Rochelle, New York, about 1848 (15).

The Logan berry is a weak variety that matures its fruit late in this section. Each of the plantings of the variety has resulted in plants that have too little vigor to produce a crop of fruit. Commercial production is apparently limited to the Pacific Coast.

Table 4. Plant and Fruit Characters of Certain Varieties of Possible Commercial Importance

Variety	Number new canes per plant	Diameter (mm.)				Number laterals per plant	Average length of laterals (cm.)	Flavor		Number of fruit per pint	Average volume of fruit 100 (cc.)	Weight of 100 fruit (gm.)
		Main stem	Laterals					Mild (1) to strong (9)	Acid (1) to sweet (9)			
			First	Second	Third							
Alfred.....	3.0	13.4	6.5	6.0	5.1	7.4	71.8	8.	6.	115	2.70	285
Austin's Improved.....	3.3	11.2	5.5	4.8	4.7	16.3	145.7	6.5	5.25	152	2.18	229
Blowers.....	1.9	13.8	6.3	6.3	5.9	6.2	71.4	8.	7.	110	2.88	300
Crandall's Early.....	2.8	12.6	6.2	5.9	5.5	11.3	108.5	7.5	7.25	142	2.56	236
Dallas.....	4.2	12.6	5.8	5.6	5.4	8.8	82.5	7.	5.75	164	2.29	222
Early Harvest.....	1.8	10.2	4.8	4.6	4.3	8.9	57.8	1.	7.75	201	1.76	171
Early Wonder.....	2.4	12.5	6.9	6.2	5.9	13.7	112.4	7.	5.	103	3.10	331
Eldorado.....	3.1	12.1	6.0	6.0	5.4	6.3	55.9	7.	7.	120	2.86	272
Hall's Lawton.....	3.3	14.6	6.3	6.2	5.8	14.9	74.4	6.75	2.	119	3.04	278
Haupt.....	4.6	12.9	5.7	5.2	4.9	16.4	136.1	5.	4.25	172	1.94	204
Kenoyer.....	1.9	11.8	5.9	5.6	5.3	6.3	52.1	7.	7.3	168	2.06	209
Rathbun.....	3.2	10.9	4.9	4.6	4.5	12.3	59.4	1.	8.	258	1.45	149
Robinson.....	2.7	15.4	6.5	6.2	5.9	14.0	87.4	7.	3.	121	2.70	268
Young Dewberry.....	2.5	11.7	6.2	5.8	5.5	6.7	219.5	8.75	8.25	69	4.16	431
Average.....	2.9	12.6	6.0	5.6	5.3	10.7	95.35	144	2.55	256

(1) Represented by a scale—1 mildest to 9 strongest, and 1 sourest to 9 sweetest.

Lucretia is a trailing vigorous variety producing canes 8 to 10 feet in length. Primordial canes are prostrate, having a large number of short straight prickles on cane and foliage. However on second-year canes the slightly curved prickles are less than the average in number and length on both foliage and cane. It has proved free of disease except for mild attacks of rosette, and it is also resistant to drouth conditions. An early bloomer, it matures its fruit during May. The fruit is medium to large, of an attractive jet black color, with a variable-sized seed ranging from medium to large. The mild flavored fruit is somewhat soft if allowed to mature fully. The variety produces well. It is recommended for fancy pack on local markets.

Macatawa appears to be the same as Crandall's Early. Two lots of plants purchased from different sources and studied under this name were not the Macatawa. A third lot of plants, of unquestioned name, identifies it with Crandall's Early. In a letter of December 1, 1934, Mr. Walter Knott remarked: "A number of growers in Central California had some young fields which they claimed were a selected strain of the Crandall's Early which they called Macatawa. We bought plants from them and they were better than most of the ordinary Crandall's Early growing in this part of the State."

Mammoth is a late variety that has a tendency to produce large primordial canes the first season, but soon succumbs to the leaf spot, anthracnose, orange rust, and sun-scald. It is also susceptible to the rosette. Plant growth is ascending and recurving. There are many prickles on both cane and foliage. The large fruit is long and tapering, of fair quality, with a large seed.

Manatee is a trailing variety of fair vigor that is very susceptible to the leaf spot. It is among our earliest maturing varieties and is fairly productive, but lacks uniformity of plants and fruit. The fruit is soft, medium in size, and of fair quality. The seeds are medium-sized.

Marvel is a very late variety with semi-erect cane growth of fair vigor. The fruits are of medium size. There is uneven maturity of the drupelets. The quality is fair; seeds are medium to large. It is susceptible to orange rust.

Mayes. See Austin.

McDonald is one of the oldest of the Texas dewberry varieties. The trailing canes are of good vigor and bloom the latter part of March. The flowers are completely self-sterile; therefore the variety must be interplanted with another variety of the same blooming date. The medium-sized flowers are white and have small lanceolate sepals. The general habit of growth is procumbent, with primordial canes erect to semi-erect. There are 3 to 5 small leaflets per leaf. The curved prickles on the leaves and canes are comparatively few in number and are shorter than in most varieties (Table 3). Maturity of fruit extends over the month of May. There is

an average of 4 fruits per cluster and 11 clusters to the foot of representative fruiting area. Production is heavy, as the variety is drought resistant and somewhat resistant to disease. Berries are of medium size, black, with medium-sized seed. The quality is good, both for shipping and canning. A native of Texas, it was introduced into cultivation by the Texas Nursery Company. Bailey (3) considers this a selection of *Rubus velox* Bailey.

Mersereau is a very late, erect variety of fair vigor, but is quite susceptible to orange rust. The large jet black fruits of excellent quality set 9 to 10 per cluster well toward tip of lateral growth. For selection of a late variety the Blowers or Eldorado is preferable.

Mount Pocono is very late for Texas conditions, and has poor vigor and semi-erect cane growth. It has the usual characters of the northern high-bush blackberry. It is susceptible to orange rust and nematode.

Ozark Beauty is apparently a selection of the Lawton blackberry.

The **Pink Blackberry** is tender to cold, the canes often being frozen back to the ground. When not affected by low temperatures it produces a dense, vigorous, ascending and recurving cane growth consisting of numerous laterals with many secondary laterals covered with sharp hooked prickles. The production is fair. The berry is pink, sweet, with small to medium seed.

Robinson is an erect, very vigorous variety having plant and fruit characters similar to the Lawton (Tables 1, 2, 3, and 4), though not as productive. The stout main canes reach a height of 5 to 7 feet if not tip-pruned. It appears to be free from disease and nematode. It matures during mid-season. The berries are medium to large, firm, black, and of good quality. The seed are medium to large. Bailey (1) places the Robinson as *Rubus profabilis*, and the Lawton as *R. frondosus*. It originated with Willard Robinson, Cisco, Texas (11).

Rogers is a vigorous trailing variety with a blooming and fruiting season four weeks earlier than most varieties. Yields were materially reduced by late frosts three years out of five. Many new canes with a profuse growth of laterals put forth from the parent stool, each tip of which roots when left in moist ground. The plants are difficult to handle on a trellis or to stake unless thinned. One or two berries are produced per cluster. They are of medium size, with loose drupelets, soft flesh, of good quality, and medium-sized seed. Like the Advance it has commercial possibilities near the Coast and South Texas. It was discovered near Alvin, Texas, by a Mr. Rogers and was introduced about 1893 by C. Falkner, Waco, Texas.

Russell (Best of All). Plant and fruit characters are identical to those of Early Harvest.

Snyder is a late erect variety of fair vigor, susceptible to orange rust and to nematode. There are around 14 berries to a cluster with clusters forming on tips of lateral growth. The fruit is large, sweet, firm, with medium to large seed. Like a majority of late varieties it has a habit of developing few laterals on the main stem, and producing a low yield of fruit because of drouth conditions prevailing late in the season.

Special is a very vigorous and productive wild blackberry selection of early medium maturity. Cane growth is ascending and recurving with primordial canes being erect. It has an average number of prickles per leaf, but the canes show a greater number of slightly curved prickles than most varieties. The 10 to 12 clusters per foot of fruiting area have 3 to 4 berries each. The fruit is medium, drupelets loose, medium firm, quality fair, seed medium. Both plant and fruit are variable, as the variety probably represents several individual selections. This variety was selected and introduced by the Cistern Nursery, Flatonia, Texas.

Star or Wonder is a very late and very weak procumbent variety. It is susceptible to nematode and orange rust. The flower sepals are unusually long, petals pink.

Stone's Hardy is a very late, semi-erect variety with fair vigor, but susceptible to orange rust. It sets an average of 17 berries per cluster with 7 clusters per foot of fruiting area. The fruit is medium to large, black, firm, and of good quality. Birds and drouth cause the loss of a greater portion of the crop.

Taylor is a medium late variety of weak growth. Plant growth is semi-erect, very susceptible to orange rust and to leaf spot. The berry is medium-sized, firm, of fair quality. The production is poor.

Texas Wonder is a vigorous variety having canes ascending and recurving, primordial canes erect, 4 to 6 annually from the parent stool, with numerous laterals. It is a profuse bloomer during the latter part of March and early April. The medium-sized flowers are white. There are 5 leaflets of less than average size. The prickles are curved and below the average in number and length. It promises to be a heavy producer, free from disease. The fruit is attractive on the plant and in the pack. It is medium to large and of good quality, firm, with medium seed. It may be as successful as Early Wonder, as both varieties have several characters in common. Mr. C. D. Cuthbertson, Comanche, Texas, states in correspondence that the original plant was found by him in the woods adjacent to a berry patch and introduced in 1918. This is considered by Mr. Ross R. Wolfe of Stephenville to be synonymous with the "Dew-Black" introduced by him in 1926.

Thornless. Of several strains of thornless tested at this Station each has proved to be low in vigor and production. The canes are procumbent, in some instances reverting to spiny character, and are subject to rosette, anthracnose, and leaf spot. The fruits are somewhat soft, of excellent flavor, with a large seed. The Thornless Austin is being used as breeding

material for the single factor of freedom from prickles on both canes and leaves (12). Thornless selections of the Young dewberry are receiving the approval of many growers.

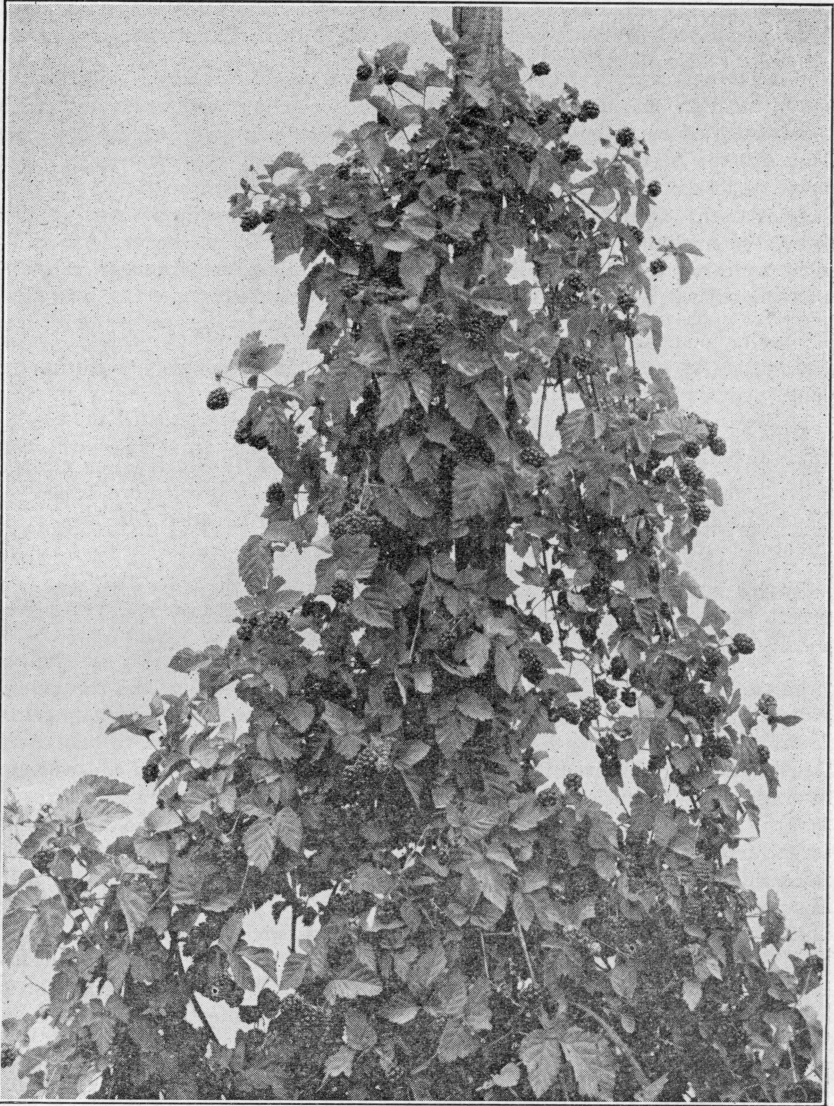


FIGURE 4. Young Dewberry Showing Habit of Growth.

Ward is a rather late, erect variety having fair plant vigor. It is a poor producer of medium size fruit, which is of fair quality, firm, with a medium size seed. It is susceptible to orange rust and to nematode.

Young. This dewberry variety has attracted a wide interest during recent years. In East Texas it has proved very popular due to the size and excellent flavor of its fruit, ease of harvesting, and vigor of plants. The yields have been well above the average (Table 2). The canes are somewhat susceptible to anthracnose. Where the canes are tied to stakes, sun-scald causes a limited amount of injury. The plants are trailing, 2 to 3 new canes being produced each season from the base of the main cane. It roots easily at the tip or at any portion of the cane when covered with soil. There are 3 to 5 leaflets per leaf, each somewhat longer than common (Figure 4). The leaf bracts are lanceolate and are considerably longer than those of most varieties. The curved prickles are greater in number than usual for both cane and leaf, with those on the cane being unusually longer. However the prickles are not considered a deterrent to harvesting as the fruit is produced on racemes 5 to 6 inches in length growing nearly perpendicular to the cane (Figure 3). The large white flowers with large sepals appear in early April. The fruit ripens two weeks before the average variety. The berries are very large, 69 to the pint, 100 fruit weighing 431 grams (15 oz.). The purplish-black drupelets are large and soft when fully matured. The seed are few, but large and scarcely noticeable. The pack is attractive, and a favorite on local markets. Icing should be used for long distance shipping. It was originated by B. M. Young of Louisiana as a result of a cross of the Phenomenal with Mayes dewberry, made in 1905 (17).

Wonder. See Star.

VARIETAL RECOMMENDATIONS

Early Maturing:

Home Orchard: Austin, McDonald, Haupt, and Lucretia. (McDonald should be interplanted with other varieties due to its self-sterility.)

Commercial Plantings: Austin, Lucretia.

Mid-season Maturing:

Home Orchard: Crandall's Early, Dallas, Early Harvest, Early Wonder, Lawton, and Young. (Though apparently not as productive as the Young, Boysen can be included in order to have a continued supply of high quality fruit.)

Commercial Plantings: Crandall's Early, Dallas, Early Wonder, Lawton, and Young.

Late Maturing:

Home Orchard: Blowers. (None entirely satisfactory.)

Commercial Plantings: None.

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