

# Susceptibility of Blackberry and Blueberry\* Cultivars to Winter Injury

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A record cold period during January 1970 in Arkansas provided a unique opportunity to evaluate fruit varieties for cold hardiness. Minimum temperatures at Fayetteville were below 0°F for 4 consecutive days from January 6 to 9 and reached a low of -15°F on January 9 (Table I). Examination of flower bud samples taken from rabbit-eye blueberry cultivars on January 17 revealed a high degree of mortality. Temperatures during the remainder of the winter were normal for Arkansas, and subsequent expressions of winter injury are believed to have resulted from the early January freeze.

## Blackberry

Visual evaluations of winter injury were made on April 27 in a 4 year old replicated planting of 12 blackberry cultivars. Each replication of each cultivar was rated on a scale of 1 to 10, with 10 indicating no apparent injury, and 1 indicating complete kill to the ground. At this time, the blackberries were in bloom and ratings were based on relative extent of injury to canes and the relative amount of bloom.

The mean winter injury rating for each blackberry cultivar in April, and the subsequent fruit yield are shown in Table II. Ratings made in April show three distinct classes of cultivars with respect to injured canes. Bailey, Raven, and Ranger appeared to be least injured, while Dallas, Wells Beauty, Lawton, Humble, and Brazos were extensively damaged. Other cul-

tivars were intermediate. When yields are considered, however, it is apparent that ratings made in April were not significantly correlated with subsequent yields. While yields of all cultivars were reduced by winter injury, Darrow and Hedrick showed the least loss of production. These varieties were rated as intermediate in the April evaluation. The cultivars Raven, Bailey, and Ranger, which appeared to be least injured in April produced very little fruit. No fruit was harvested from cultivars rated 3 or below

Table I. Maximum and minimum temperatures recorded at Fayetteville, Arkansas, January 1-14, 1970.

| Date   | Temperature (°F.) |      |
|--------|-------------------|------|
|        | Max.              | Min. |
| Jan. 1 | 40                | 9    |
| 2      | 31                | 10   |
| 3      | 40                | 5    |
| 4      | 44                | 14   |
| 5      | 39                | 16   |
| 6      | 17                | -3   |
| 7      | 19                | -8   |
| 8      | 12                | -14  |
| 9      | 29                | -15  |
| 10     | 34                | 2    |
| 11     | 38                | 32   |
| 12     | 37                | 23   |
| 13     | 47                | 15   |
| 14     | 50                | 20   |

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**Table II. Winter injury ratings, yield, and fruit size of blackberry cultivars. Fayetteville, Arkansas, 1970.<sup>1</sup>**

| Cultivar     | Winter Injury Rating <sup>2</sup> | Yield (Lbs./A.) |
|--------------|-----------------------------------|-----------------|
| Bailey       | 9.3 a                             | 839 bc          |
| Raven        | 8.8 a                             | 290 cd          |
| Ranger       | 8.8 a                             | 91 d            |
| Hedrick      | 7.0 b                             | 2458 a          |
| Ebony King   | 6.5 b                             | 1387 b          |
| Midnite      | 6.3 b                             | 552 cd          |
| Darrow       | 6.0 b                             | 2639 a          |
| Dallas       | 2.0 c                             | 0               |
| Wells Beauty | 2.0 c                             | 0               |
| Lawton       | 2.0 c                             | 0               |
| Humble       | 2.0 c                             | 0               |
| Brazos       | 1.0 c                             | 0               |

<sup>1</sup>Means of 4 replications. Means within columns followed by same letter or letters are not statistically different.

<sup>2</sup>Ratings made 4/27/70. Rating scale of 1-10: 10 = no apparent injury; 1 = killed to ground.

in April, but all produced new, vigorous canes during the season.

It appears that wood and/or flowers of some cultivars that appeared normal at bloom in April were actually damaged, resulting in failure to set or develop into normal fruits. Thus, evaluation of cold injury in early spring, based on vegetative growth and flowering, may not be a good indication of actual damage to production.

From these data, it appears that Darrow and Hedrick were the most hardy of the 12 cultivars tested; and Lawton and the Texas cultivars, Dallas, Humble, Brazos, and Wells Beauty were the most susceptible to winter cold.

### Blueberry

Yield and fruit size data were taken in 1970 from a replicated planting

consisting of 5 rabbiteye and 13 highbush blueberry cultivars. At bloom we observed that many of the flower buds on rabbiteye cultivars failed to open, and dissection of these buds showed that they were dead. The high incidence of dead flower buds resulted in considerable yield reductions of the rabbiteye cultivars for the season (Table III). Highbush cultivars in the same planting bloomed normally and produced normal crops, with no indication of any type of winter injury.

Among the rabbiteye cultivars, Tifblue appeared to be the most hardy, followed by Menditoo and Woodard. Homebell and Gardenblue showed extensive winter injury and yields were very low.

Similar plantings of blackberry and blueberry cultivars exist in central Arkansas at the Fruit Substation, Clarksville, and the Strawberry Substation, Bald Knob. Minimum temperatures recorded at these locations were 0°F at Clarksville and 4°F at Bald Knob, both on January 9. Evaluations of planting at these locations showed no evidence of winter injury, and yields were normal.

**Table III. Yield and fruit size of rabbiteye blueberry cultivars. Fayetteville, Arkansas, 1970.<sup>1</sup>**

| Cultivar   | Yield (Lbs./A.) | Mean Fruit Size (gms) |
|------------|-----------------|-----------------------|
| Tifblue    | 6093 a          | 1.23 a                |
| Menditoo   | 3672 b          | 1.29 a                |
| Woodard    | 3509 b          | 1.49 a                |
| Gardenblue | 805 c           | 1.03 a                |
| Homebell   | 454 c           | 1.16 a                |

<sup>1</sup>Means of 3 replications. Means within columns followed by the same letter are not statistically different.

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