# Blackberry Harvesting and Postharvest Handling

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# Overview

Blackberries are harvested in Georgia from mid-May to August. Most varieties grown in Georgia were developed by the University of Arkansas breeding program. The blackberry varieties cultivated in Georgia are primarily intended for fresh-market sales and are harvested by hand, while machine harvesting can be used for fruit that will be frozen.

Blackberries are a highly perishable fruit; since they lack both *cuticles* (protective outer coverings) and carbohydrate resources, they have high respiration and transpiration rates. Because of the fruits' delicate skin, they cannot be cleaned or cooled using water. The shelf life of blackberries is limited by high rates of respiration, water loss, softening of the fruit, decay, and mechanical damage. To slow down deterioration in quality, it is imperative to reduce the temperature of the fruit as soon as possible after harvest.

To obtain maximum fruit quality, it is essential to harvest blackberries when fully ripe and to transport the fruit using refrigerated trucks at 32 °F.

Photo: Zilfina Rubio Ames

# Harvest Guidelines

Blackberries must be harvested fully ripe since the fruit will not ripen or change color after harvest. In other words, the eating quality does not improve after harvest. Blackberries should pull easily from the plant when ripe, and the core (receptacle) should remain in the fruit.

When harvesting:

- Pick fruit early in the day when the temperature is cool.
- Avoid picking fruit that is wet, whether from dew or rain.
- Gently pick the fruit by hand and place into small containers to avoid bruising.
- Do not place soft or decaying berries into containers.

Blackberries are sorted, graded, and packed in the field, and only one person (the picker) should touch each berry throughout this process.

While the berries are picked based on berry surface color, soluble solids (Brix) and titratable acidity also may be considered for acceptable flavor. A minimum of 7% soluble solids and/or a maximum of 0.8% titratable acidity is recommended.

# Cooling and Cold-Storage Guidelines

It's critical to control temperature and relative humidity during cooling and storage to preserve fruit quality and avoid berry weight loss. Blackberry fruit have a postharvest shelf life of 1–2 weeks when handled properly.

After harvest:

- The fruit must be rapidly cooled to 32 °F and kept cold to slow down transpiration.
  - » Forced-air cooling is the best method to cool blackberries.
  - » Avoid hydro-cooling or ice-cooling.
- Blackberries must be held at 32 °F and between 90% and 95% relative humidity to avoid water loss, reduce decay, and extend postharvest life.
- Do not allow the fruit to rewarm, as this can cause condensation, wet berries, and ultimately result in microbial growth and degradation.

**Ideal storage conditions:**

Temperature 32 ±1 °F

Relative Humidity 90%–95 %

Blackberries show no response to ethylene

# Packaging

Packing should be done in the field and the packaging area must be under shade because sun exposure rapidly increases fruit temperature.

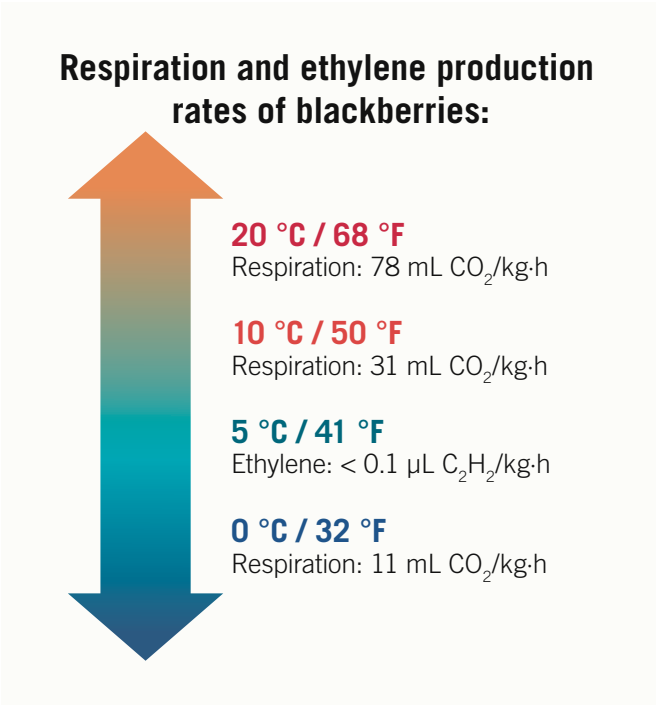
A variety of packaging containers are used to pack blackberries, but plastic clamshells are the most commonly used. Plastic clamshells are sturdy, protect the fruit from mechanical damage, do not stain, and are inexpensive. The transparency of plastic clamshells allows consumers to inspect the fruits without touching them.

A suitable packaging container is wide and shallow. No more than three layers of fruit should be packed in each container to avoid crushing the fruit on the bottom, which can cause leaking. An absorbent pad often is placed in the bottom of the container to absorb moisture and leaking juices. The pad also provides cushioning to prevent bruising and damage to the fruit.

Modified atmosphere packaging for shipments with 15%–20% carbon dioxide and 5%–10% oxygen reduces the growth of decay-causing organisms.

# Postharvest Issues

The most common postharvest issues in blackberries are the loss of fresh weight, red drupelet reversion, and leakiness. Fruit-rot diseases also can cause issues postharvest. The primary postharvest fruit rot on blackberries is *Botrytis* fruit rot. *Rhizopus* and *Mucor* also can cause a soft rot after harvest, but these pathogens are less important. Proper postharvest storage conditions are essential to reduce postharvest fruit rots caused by these fungi.




*Note. Adapted from "Fruit Produce Facts: Bushberries," by E. J. Mitcham, C. H. Crisosto, and A. A. Kader, 1998 (https://postharvest.ucdavis.edu/Commodity_Resources/Fact_Sheets/Datastores/Fruit_English/?uid=12&ds=798). Copyright 1998 by the University of California.*

## Fresh Weight Loss

Weight loss in fresh blackberries occurs rapidly because of their high transpiration and respiration rates. Moisture loss in berries causes not only fresh weight loss but also fruit shriveling, loss of gloss, and a reduction in firmness. To slow down transpiration, berries should be placed in protective packaging right after harvest and then stored under high humidity and low temperature with little air movement.

## Leakiness

Leakiness limits marketability and it is increasingly likely when the fruit is exposed to high temperatures after harvest. Packing more than three layers of fruit or overfilling the clamshells can cause compression on the fruit, which in turn increases the incidence of leakiness.

## Red Drupelet Reversion (Reddening)

*Red druplet reversion*, or reddening, is a postharvest disorder in which black *drupelets*—the small fleshy parts that make up a whole blackberry—revert to a red color. The causes are not fully understood, but could include exposure to room temperatures after cold storage. The disorder can be worse in some varieties and has been linked to high nitrogen fertilization rates. High-speed cold airflow tends to cause reversion on the most-exposed fruits when the berries have been damaged, either by bruising or fruit compression, during harvest or shipping. Blackberries with a core temperature above 73 °F at harvest tend to have a higher incidence of red drupelet.

**Minimal damage** **Moderate damage** **Severe damage**

*Note. Adapted from "USDA Visual Aid BLK-1," by the Agricultural Marketing Service, 2018 (https://www.ams.usda.gov/sites/default/files/media/BlackberryVisualAids.pdf). Copyright 2018 by the USDA.*

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