

Grape (American)

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Scientific Name and Introduction: American grapes (*Vitis labrusca* L.) are grown in areas of the U.S. where *V. vinifera* has marginal survival, usually because of lack of cold hardiness. Juice, wine and table grape varieties have been developed from *V. labrusca*. The best known grape cultivars are Concord, Catawba, Delaware, Niagara, Venus, Himrod, and Reliance.

Quality Characteristics and Criteria: High quality grapes are free of injury, decay, cracking, and sunscald, appear and feel turgid, have a dry stem scar, and are fully colored. The rachis should be green and berries are firmly attached to pedicels. Bunches should be compact but berries not too tightly packed.

Horticultural Maturity Indices: For fresh market, berries should be harvested when SSC is 14 to 18%.

Grades, Sizes and Packaging: No standard packaging is used with American grapes. Grapes are usually packed as intact or trimmed clusters (rachis and berries) in bulk in lugs, in quart-size vented plastic containers, or in plastic slit bags of 2 lb (0.9 kg).

Pre-cooling Conditions: Forced-air cooling to lower the temperature to < 2 °C (35.6 °F) within a day of harvest is recommended.

Optimum Storage Conditions: American grapes can be held 4 to 7 weeks at -0.5 to 0 °C (31 to 32 °F) with 85 to 90% RH (Ginsburg et al., 1978). Exposure to temperatures above 0 °C (32 °F) can greatly increase shatter and decay, especially in tightly packed clusters.

Controlled Atmosphere (CA) Considerations: CA is not currently used for American grapes.

Retail Outlet Display Conditions: Store and display grapes at the coldest refrigeration temperature possible. Delays in cooling greatly increase shatter and decay (Lutz, 1939).

Chilling Sensitivity: American grapes are not known to be chilling sensitive.

Ethylene Production and Sensitivity: Stimulation of *Botrytis cinerea* (gray mold) growth can occur on berries and stems in the presence of ethylene. Production from American grapes is < 0.1 $\mu\text{L kg}^{-1} \text{h}^{-1}$.

Respiration Rates:

Temperature	mg CO ₂ kg ⁻¹ h ⁻¹
0 °C	3
4 to 5 °C	5
10 °C	8
15 to 16 °C	16
20 to 21 °C	33
25 to 27 °C	39

To get mL kg⁻¹ h⁻¹, divide the mg kg⁻¹ h⁻¹ rate by 2.0 at 0 °C (32 °F), 1.9 at 10 °C (50 °F), and 1.8 at 20 °C (68 °F). To calculate heat production, multiply mg kg⁻¹ h⁻¹ by 220 to get BTU per ton per day or by 61 to get kcal per metric ton per day. Data from Lutz, 1939.

Physiological Disorders: Disorders encountered on American grapes include sunburn, shrivel from low RH storage, and bleaching or stipple near berry pedicels from SO₂ application (Morris et al., 1992).

Postharvest Pathology: American grapes are susceptible to gray mold (*Botrytis cinerea* Pers.), ripe rot [*Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc.], Macrophoma rot (*Botryosphaeria dothidea* (Moug. Ex Fr.) Ces & de Not.), powdery mildew [*Uncinula necator* (Schw.) Burr.], blue mold (*Penicillium*), Alternaria [*Alternaria alternata* (Fr.) Keissl], and Cladosporium rot [*Cladosporium herbarum* Pers.:Fr.] (Hewitt, 1988). Undeveloped berries can show infection by black rot [*Guignardia bidwelli* (Ellis) Viala & Ravaz].

Quarantine Issues: None known.

Suitability for Minimal Processing: Unknown.

Special Considerations: Sulfur bisulfite pads used with plastic liners can extend shelf-life by 2 to 4 weeks, but many cultivars are sensitive to SO₂ injury. Handle clusters carefully during and after harvest to prevent cracking or berry loosening at pedicels.

References:

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- Morris, J.R., O.L. Oswald, G.L. Main, J.N. Moore and J.R. Clark. 1992. Storage of new seedless grape cultivar with sulfur dioxide generators. *Am. J. Enol. Vitic.* 43:230-232.
- Hewitt, W.B. 1988. Berry rots and raisin molds. In: Pearson, R.C. and A.C. Goheen (eds) *Compendium of grape diseases and insects*. APS, St. Paul MN, pp. 26-27.