

Summer bunch rot/sour rot and *Aspergillus* Vine Canker of Grapevine

Current Management Options

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BACKGROUND: Summer bunch rot (SBR) is a disease complex affecting grapes caused by multiple organisms such as *Botrytis cinerea*, *Aspergillus tubingensis*, *A. carbonarius*, *A. niger*, *Alternaria* sp., *Cladosporium* sp., *Rhizopus* sp., and *Penicillium* sp. (Fig. 1-2). Ripening berries (> 8° Brix) are susceptible to infection by these fungi that frequently enter through injuries caused by insects or birds, mechanical injury (especially during mechanical leaf removal), or scars caused by powdery mildew (Fig. 3). SBR is more prevalent in the warmer areas of central and southern San Joaquin Valley, whereas *Botrytis* bunch rot (only by *Botrytis* spp.) is more common in the cooler northern San Joaquin Valley and coastal production areas. Recently, sour rot (or melting decay) has separately been characterized from SBR, differing by the presence of yeasts and acetic acid bacteria that produce a vinegar-like smell. Both yeast and bacteria can be spread by vinegar fruit flies (*Drosophila*) that are attracted to the rotting clusters (Fig. 2B). By the time sour rot has developed, it is often difficult to determine the primary cause.

Our studies have shown that these *Aspergillus* species associated with SBR can also cause *Aspergillus* vine canker (AVC) on grapevine wood (Fig. 4), a disease different from common grapevine trunk diseases. A single vine can harbor multiple *Aspergillus* species located on different parts of the vine, including the trunk, cordon, and spurs.

SYMPTOMS

Summer bunch rot can be recognized by masses of black, brown, or green spores on the surface of the berries (Fig. 2, 3), leakage of berry juices, and the presence of vinegar flies. Symptoms include hairline cracks in the berry skin, watery discoloration of berries, and general berry breakdown. Decay continues to develop slowly under cold storage conditions.

Aspergillus vine canker can be easily distinguishable by their premature senescence of leaves during the fall, while healthy vines are still green (Fig. 4A). Black sporulation at the surface and underneath the bark of affected tissues is very common (Fig. 4D). Internally, a brown discoloration is evident in the xylem near the margin of the cankers (Fig. 4B), whereas the areas under the sporulation show necrosis and black discoloration near the bark (Fig. 4C). In severe cases, the canker can girdle most of the vascular area.

MANAGEMENT

Canopy management practices such as shoot thinning, hedging, and leaf removal can be used to manage canopy density when appropriate. Removal of basal leaves immediately after berry set can significantly reduce disease incidence and severity. In warmer growing areas, excessive leaf removal may result in sunburned fruit. This condition worsens when leaves are removed later in the season, especially on canopies with southern and western afternoon exposures. Our laboratory annually examines the efficacy of fungicide treatment programs to prevent and control these complex diseases using synthetic, biological, and organic fungicides. Results from these trials can be found on our lab website at <https://ucanr.edu/sites/eskalenlab>

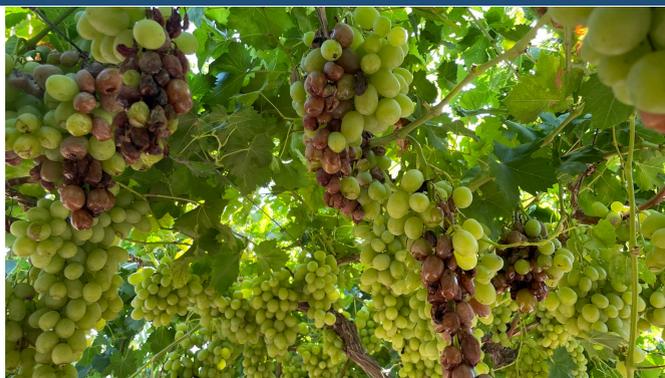


Figure 1. Summer bunch rot symptoms on table grape



Figure 2. Summer bunch rot symptoms on wine grape (A). Sour rot and fruit flies (B).

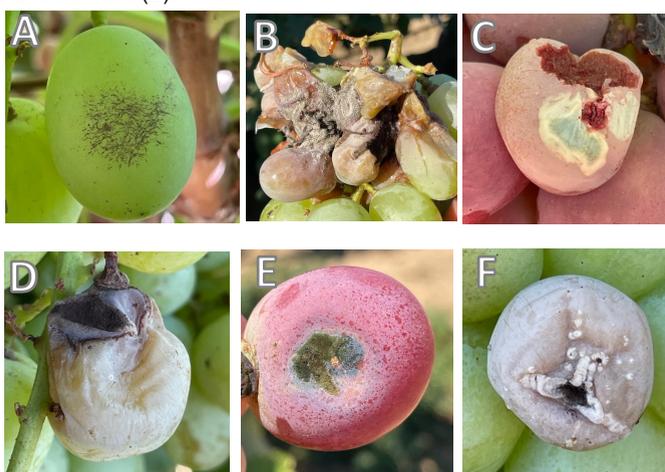


Figure 3. Various summer bunch rot/sour rot symptoms on berries (B-F). Powdery mildew scar (A), *Botrytis* (B), *Penicillium* (C), *Aspergillus* (D), *Cladosporium* (E), yeast (F).

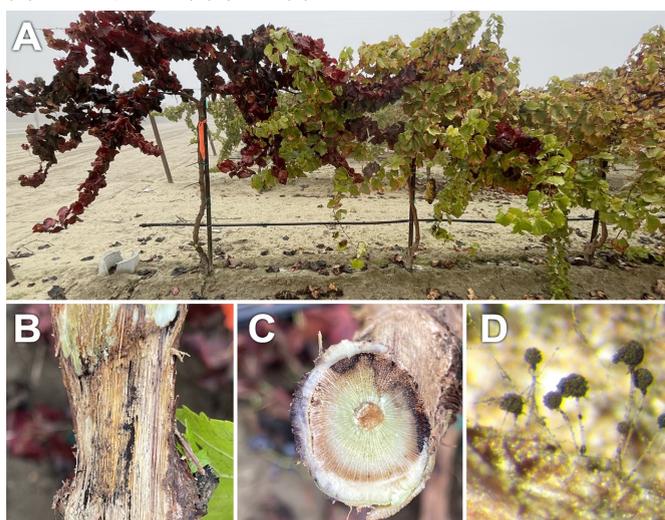


Figure 4. Symptoms of *Aspergillus* Vine Canker of grapes in California. Premature senescence of the canopy during the fall (A). Sporulation on cankered tissue (B). Cross-section of a trunk showing cankers (C). Sporulation of black aspergilli on decayed berries (D).