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Study finds winegrape varieties respond similarly to drought

The Washington State University research suggests irrigation decisions may depend more on soil conditions and canopy size than on varietal labels

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A Washington State University study found that winegrape varieties may respond more similarly to drought than many growers have assumed, a result that could affect how vineyards manage irrigation as water becomes more limited.

The research followed 30 winegrape varieties in a vineyard over two years and measured how the vines responded physiologically to reduced water. According to the study, the varieties showed broadly similar responses to drought conditions rather than clear differences that would support strong varietal rankings for drought tolerance.

That finding challenges a common way of thinking in viticulture, where some grape varieties are often treated as more drought tolerant than others when growers make irrigation plans. The study instead points to other factors as important drivers of how vines perform under water stress, especially soil conditions and the amount of leaf area, or canopy mass, on the plant.

If that pattern holds across more sites and seasons, it could shift attention away from simple variety-based assumptions and toward vineyard-specific management. For growers, that would mean irrigation decisions may need to rely more heavily on local soil characteristics, vine growth and direct field measurements than on the name of the grape variety alone.

The work also has practical importance for the beverage industry because wine producers depend on stable grape yields and fruit quality while facing pressure to reduce water use. More precise irrigation strategies could help vineyards save water without relying on traditional drought-tolerance labels that may not fully reflect how vines behave in the field. That, in turn, could influence production costs and long-term planning for wineries in dry regions.

The study does not suggest that all grape varieties are identical in every respect. Instead, the reported results indicate that, in this vineyard and over the two-year observation period, physiological responses to drought were similar enough to raise questions about broad varietal classifications. That makes the site itself, and the way the vineyard is managed, a more central part of the discussion.

Researchers in grape production have increasingly focused on how vines cope with water stress as higher temperatures and more variable rainfall affect farming. In that context, findings that emphasize soil and canopy size may give growers more direct tools to adjust irrigation. Soil type influences how much water is available to roots, while leaf area affects how much water the plant uses through transpiration.

For vineyard managers, the practical message is that drought response may be shaped as much by the conditions around the vine as by the variety planted in the row. That could lead to more targeted irrigation programs, including decisions based on block-by-block soil differences and canopy management rather than a broad assumption that one variety will always need less water than another.

The study adds to a growing effort to refine water management in winegrape production at a time when agriculture is under pressure to improve efficiency. For growers supplying the wine market, the research suggests that better water savings may come from understanding each vineyard’s soils and vine growth patterns in detail, rather than relying mainly on long-standing ideas about varietal drought tolerance.