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Brazil trial finds 8 grape varieties slash fungicide use in Minas Gerais vineyards

Researchers said the PIWI vines needed no downy mildew fungicides in two cycles, showing promise for sustainable wine production

Wednesday, November 11, 2026



A field trial in southern Minas Gerais found that eight disease-resistant grape varieties can sharply reduce the need for fungicides in vineyards while still showing promise for wine production, according to Brazil’s Agricultural Research Company of Minas Gerais,

known as EPAMIG.

The study, carried out from 2021 to 2025, focused on varieties in the PIWI group, a term of German origin used for grapevines bred to resist fungal diseases. The research was conducted in a vineyard at the Stella Valentino winery in Andradas, in the state of Minas Gerais, using plant material donated by the Italian nursery Vivai Cooperativi Rauscedo.

The project examined how the vines performed under local growing conditions and whether the grapes could also produce wines with acceptable technical and sensory characteristics. According to EPAMIG researcher Cláudia Souza, who coordinated the work, the goal was to identify alternatives that could support more sustainable grape growing without giving up quality.

The trial included four white varieties — Sauvignon Kretos, Sauvignon Rytos, Fleurtai and Soreli — and four red varieties — Merlot Kanthus, Merlot Khorus, Cabernet Eidos and Cabernet Volos. Over the course of the study, researchers completed two summer harvests and one winter harvest.

Productivity ranged from 1.5 kilograms to 3.5 kilograms per vine, depending on the variety. But the main result highlighted by the researchers was the limited need for disease-control sprays.

Souza said that in the last summer production cycle and in the winter cycle, no fungicides were needed to control downy mildew, one of the main grapevine diseases. For powdery mildew, only three sprays were used across the two production cycles.

That result matters for Brazilian wine producers because fungicide use is one of the main cost and management pressures in vineyards, especially in humid conditions that favor fungal diseases. If similar performance is confirmed on a larger commercial scale, resistant varieties could help wineries lower chemical use, reduce labor and application costs, and strengthen sustainability claims at a time when growers are also adapting to changing weather patterns.

The PIWI varieties tested by EPAMIG are crosses between Vitis vinifera, the species traditionally used for fine wine, and other grape species that carry resistance genes. Even so, the research institution said the plants retain more than 85% of the Vitis vinifera genetic background. EPAMIG also said the varieties are registered as belonging to that species in European varietal catalogs and by Brazil’s Ministry of Agriculture and Livestock.

Beyond vineyard performance, the eight cultivars were also put through microvinification, a small-scale winemaking process used to assess enological potential before broader commercial adoption. EPAMIG said those tests indicated the varieties have winemaking potential under the conditions studied in southern Minas Gerais.

The findings add field data from Brazil to a broader international push to develop grapes that can better withstand disease pressure without relying heavily on crop protection products. In regions where repeated spraying is often needed to preserve yield and fruit quality, disease-resistant material has drawn attention as a possible way to cut environmental impact and make production more resilient.

In Minas Gerais, that question has practical importance because the state has expanded its profile in wine production in recent years, including through winter harvest systems that shift ripening to drier months. Testing resistant cultivars in those conditions gives producers more information about whether the vines can fit into local production models rather than only performing well in European settings where many PIWI varieties were first developed.

Souza said the study was designed to verify both field behavior and wine potential in the region. According to EPAMIG, the results suggest the group of varieties could widen the options available to growers seeking lower-impact viticulture while also appealing to consumers interested in agricultural practices with a smaller environmental footprint.

For the beverage industry, that could eventually influence more than farming practices. If resistant grapes prove commercially viable, they may shape decisions on vineyard investment, varietal portfolios and how Brazilian wineries position their products in a market that is paying closer attention to production methods as well as flavor and origin.