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Climate study warns 85% of world’s wine regions face extinction

A rise of four degrees Celsius could render nearly all current vineyards unsuitable for traditional grape varieties.

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The global wine industry is facing significant challenges as climate change alters weather patterns and impacts grape cultivation. In recent years, extreme weather events have affected vineyards across major wine-producing regions, including Italy,

Spain, Australia, Argentina, Chile, Brazil, and South Africa. According to the International Organisation of Vine and Wine (OIV), 2024 saw a 10% drop in worldwide wine production due to hailstorms, sudden frosts, and severe droughts. Some regions experienced declines of up to 30%, marking the lowest production levels since 1961.

Italy, traditionally one of the world's leading wine producers, has been hit hard by these changes. In 2023, the country's wine harvest fell by 12% compared to the previous year. The decline was most pronounced in central and southern regions, where harvests dropped by 20% and 30% respectively. This reduction was linked to a 70% increase in rainfall during critical periods for disease control treatments in vineyards. The excessive rain not only made it difficult to access fields but also increased the risk of plant diseases.

In 2024, there was a modest recovery in Italy's wine sector with a 7% increase in harvest compared to 2023. However, this improvement did not bring production back to levels seen in previous years. Data from Italy's National Research Council show that drought continues to affect nearly a third of agricultural land in southern regions such as Puglia, Basilicata, Calabria, Sicily, and Sardinia. Sicily and Calabria have been particularly affected, with drought impacting up to 69% and 47% of their agricultural areas respectively.

Rising temperatures are also changing how and where grapes are grown. Over the past three decades, average temperatures in southern Italy have increased by nearly two degrees Celsius. This has led many growers to move vineyards to higher altitudes—sometimes up to 1,000 meters above sea level—in search of cooler conditions and better soil moisture. Experts warn that relocating vineyards must be done carefully to avoid damaging local ecosystems or reducing biodiversity.

While southern Italy struggles with drought and water shortages, northern regions face different problems. Persistent heavy rains and flooding have made fields inaccessible for machinery during key planting and harvesting periods. These conditions have delayed sowing and prevented the collection of hay needed for livestock feed.

Climate change is also affecting the timing of grapevine growth cycles. Warmer winters can disrupt plants' ability to enter dormancy and start new growth cycles at the right time. This can reduce yields and affect grape quality.

Looking ahead, researchers warn that further increases in global temperatures could dramatically reduce the land suitable for grape cultivation worldwide. A study published by the Proceedings of the National Academy of Sciences found that if average temperatures rise by two degrees Celsius, more than half of current wine-growing areas could become unsuitable for traditional grape varieties. If temperatures rise by four degrees Celsius, up to 85% of these areas could be lost.

One proposed solution is to diversify the types of grapes grown—known as "cultivars"—to include varieties more resistant to heat or drought. By switching cultivars, losses could be reduced significantly even under higher temperature scenarios. However, changing grape varieties can alter the taste and character of wines, which may affect both consumer preferences and economic outcomes for producers.

The Italian wine sector is now at a crossroads. After four years of stable production levels close to historical averages, output dropped sharply in 2023. Early estimates for 2024 suggest some recovery but still fall short of the five-year average. Industry experts say that adapting to climate change will require new farming practices, careful management of biodiversity, and long-term planning.

As climate pressures mount, winemakers across Italy—and around the world—are being forced to rethink how they grow grapes and produce wine. The future of this centuries-old industry may depend on how quickly it can adapt to a changing environment while preserving its cultural and economic value.