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Beckstoffer Expands UV Light Use in Napa Vineyards

The grape grower is testing ultraviolet systems to curb mildew, cut fungicide sprays and reduce vineyard emissions

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Beckstoffer Vineyards, one of California's better-known winegrape growers, said it has expanded its use of ultraviolet light technology in Napa Valley as it looks for ways to cut fungicide use and reduce the environmental impact of vineyard work.

The company said it began testing a Helios UV Boosting machine in 2022 at its Georges III and Melrose vineyards in Rutherford and later bought one in 2025 after seeing what it described as stronger vine health and lower reliance on sprays. What started as a roughly six-acre trial has grown to about 70 acres, according to the company.

The system uses UV-C light during the day, with panels placed close to the vine canopy. Beckstoffer said the treatment is meant to stimulate the plant’s natural defenses against powdery mildew, a persistent threat in many California vineyards, while also making vines less vulnerable to botrytis and stress from frost, heat and limited water.

Brian Hoefgen, Beckstoffer’s Rutherford vineyard manager, said the UV Boosting program is used alongside the company’s fungicide schedule rather than as a full replacement. He said the vines are treated three times during the growing season at different stages of development. The company said the approach works by triggering a temporary increase in salicylic acid, a compound linked to plant defense responses.

Beckstoffer also said it is testing a second UV-based system in Carneros, this time using an autonomous electric robot made by Saga Robotics. Unlike the daytime boosting machine, the robot operates at night and applies UV-C light directly to target powdery mildew spores and bacterial DNA, disrupting their ability to reproduce.

The Carneros trial covers about 10 acres across two vineyard blocks. In each block, half of the acreage is being treated with the robot twice a week until veraison, along with three targeted sprays: a clean-up spray, a pre-bloom spray and a bunch closure spray. The other half is following Beckstoffer’s standard spray program through veraison, which typically includes seven to eight applications of fungicides, insecticides and foliar nutrients.

August D’Amato, Beckstoffer’s Carneros vineyard manager, said the comparison is designed to measure whether the robot can reduce chemical inputs without sacrificing disease control. The company said cooler maritime conditions in Carneros can increase mildew pressure, making disease management especially important there.

Jim Lincoln, Beckstoffer’s general manager for Napa Valley, said the company sees both UV programs as part of a broader move toward more precise farming with fewer inputs. He said the autonomous system builds on what Beckstoffer learned from the Helios machine but adds higher-frequency treatment and direct nighttime targeting of pathogens.

The robot weighs about 900 pounds, far less than conventional tractor-mounted spray equipment, which Beckstoffer said should help reduce soil compaction in vineyard rows. Because it runs on electricity rather than diesel fuel, the company said it also lowers emissions during operation.

Beckstoffer said it expects benefits from the trial to include fewer sprays, lower labor needs, reduced fuel use and better soil health. The company owns about 4,000 acres across Mendocino County, Lake County and Napa Valley and has long positioned itself as a major player in premium California grape growing.