

NYWGF RESEARCH - FINAL REPORT

Funding for fiscal year: 2023

Project title: Novel methods to reduce late season cluster rot in vinifera vineyards

PI Investigator:

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New Research **Continued Research**

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Summary Impact Statement:

Late season cluster rot can cost growers hundreds of dollars an acre in lost revenue due to losses in both yield and quality. This project evaluated the products Parka (a crop cuticle enhancer; Cultiva, LLC, Las Vegas, NV, 89103) and Oxidate (hydrogen peroxide; BioSafe Systems, East Hartford, CT, 06108) with the goals of toughening the berry skin while also reducing the population of cluster rot organisms. The test block (cv. Riesling) developed extensive powdery mildew in July. Cluster-directed applications of Parka were effective in reducing powdery mildew infections; however, evaluation of cluster rot was not possible.

Objective: Evaluate the effectiveness of a proprietary oil/wax cuticle enhancing product, Parka, and Oxidate, an organically approved hydrogen peroxide pesticide, in reducing *Botrytis* bunch rot and sour rot.

Activities/Methods: The trial was established in a commercial Riesling block to assess the utility of a canopy and cluster-directed treatments of Parka and Oxidate. Vines were VSP trained. Cluster zone leafing was done to facilitate airflow and spray penetration. Sprays were applied with a CO2 backpack sprayer using ~ 90 GPA water, 40 psi, 3 passes/side. Parka and Oxidate were both applied 1% v/v solution using the treatments below. Each treatment was replicated by panel with 5 panels/treatment and 5 vines/panel. Data was collected from the 3 interior vines within the panel. Four spray timings were planned.

If successful, these methods would provide growers with a cluster rot control option that would not be prone to resistance, would fit in with sustainability goals and would likely be acceptable to those wishing to use organic methods.

Table 1. Parka/Oxidate trial - treatment dates, 2023

Treatment	Target zone	Treatment	Treatment timings		
			7-12	7-27	8-10
1	Cluster zone	Parka	x	x	x
2	Whole canopy	Parka	x	x	x
3	Cluster zone	Oxidate	x	x	x
4	Cluster zone	Parka + Oxidate	x	x	x
5	---	Untreated	---	---	---

Unfortunately, this block developed powdery mildew in early July that eventually led to serious deterioration of both the canopy and the fruit. This caused a pivot to rating powdery mildew on clusters rather than cluster rot. Disease was rated using the Horsfall-Barrat rating scale. Because of the serious nature of the powdery infection and deterioration of both the canopy and fruit, a fourth spray timing and collection of berry samples for assessment of ripeness were not possible.

Results/Progress/Next Steps:

Table 2. Powdery mildew incidence and severity on Riesling clusters, August 12, 2023

Treatment	Target zone	Treatment	Incidence ¹		Severity ¹	
1	Cluster zone	Parka	96.8	AB	17.8	D
2	Whole canopy	Parka	99.2	AB	35.1	B
3	Cluster zone	Oxidate	98.4	AB	25.4	C
4	Cluster zone	Parka + Oxidate	85.0	B	13.1	D
5	---	Untreated	100	A	44.4	A

¹ Values are significantly different at $p=0.05$.

Powdery mildew was first seen early July. We continued with treatment applications at the second and third timing. However, during the third set of applications on August 10, it was clear that differences in powdery mildew infection existed between treatments. For this reason, powdery mildew was rated on August 12. At this point, the majority of clusters had some infection (incidence ratings), though the combination treatment (T.4) seemed to fare the best. In terms of severity, the results were very clear. Cluster zone treatments of Parka did much better than the canopy treatment, not surprising. Parka was more effective than Oxidate, with T.1 (cluster zone Parka) and T.4 (cluster zone Parka + Oxidate) performing better than other treatments. The addition of Oxidate to Parka in T.4 did not appear to significantly improve control.

Note that treatments were applied at pre-designated timings, approximately every 10 days. If Parka and/or Oxidate had been applied at timings aimed for control of the

powdery infection, the results would likely have been more impressive. The results suggest that Parka, an oil/wax formulation, appears to function in a manner similar to that of JMS Stylet Oil. Stylet Oil is a commonly used product and in fact is often used for post-infection treatment of powdery mildew.

We have experimented with Parka for five years through multiple trials. Results have been consistent: slight reductions in *Botrytis* and powdery mildew but little to no impact on sour rot. Those interested in trying this regimen should ensure good cluster zone coverage and should use multiple sprays. Cooperating growers did not adjust their disease and insect management schedules in any way. There was some initial concern about phytotoxicity, that is, the addition of Parka treatments on top of a commercial schedule. However, through five years, we did not once detect any phytotoxicity. This was somewhat of a surprise as it is well-known that Stylet Oil and products such as captan and sulfur are incompatible as tank mixes or if applied in close proximity to one another.

Technology Transfer Plan

A PowerPoint presentation was given Jan. 12, 2023 at the Viticulture Session of the Long Island Agricultural Forum (28 attendees). Hans Walter Peterson discussed trial results from joint projects at the Jan. 10, 2024 Viticulture Session of the Long Island Agricultural Forum (25 attendees). A research report will be posted to CCE-SC grape program website, <https://ccesuffolk.org/agriculture/grape-program>.

Attachments: None

SECTION 3

Project objective

Evaluate the effectiveness of a proprietary oil/wax cuticle enhancing product, Parka, and Oxidate, an organically approved hydrogen peroxide pesticide, in reducing *Botrytis* bunch rot and sour rot.

Importance of research to the NY wine industry: In years when there is ample rain and humidity during the ripening period, cluster rots can establish and spread quickly in vineyards. Cluster rot can cost growers hundreds of dollars an acre in lost revenue due to losses in both yield and quality. Conventional chemical controls are available to manage these diseases, but they are expensive and minimally effective. This project was an attempt to use a proprietary biofilm product to toughen berry skins, with the goal of reducing berry cracking and subsequent infiltration by fruit flies (which spread sour rot). This work reflects the goals of many grape growers to reduce conventional pesticide use in favor of low impact pest management methods.

Project Results/next steps: This project evaluated the products Parka (a crop cuticle enhancer, Las Vegas, NV, 89103) and Oxidate (hydrogen peroxide, BioSafe Systems, East Hartford, CT, 06108). Parka, an oil/wax formulation, purportedly thickens the berry cuticle while Oxidate functions as a sterilant. The goal was to toughen the berry skin, thereby reducing cracking which invites infiltration by fruit flies (which spread sour rot). This Riesling block developed extensive powdery mildew in July. Because of this, cluster rot evaluations were not possible; rather, evaluation of powdery mildew was done. Cluster-directed applications of Parka were effective in reducing powdery mildew infections. Treatment sprays were applied on a calendar basis. If applications had been done in response to the powdery infections, it is likely that control would have been enhanced. In working with Parka for the last five years, it is clear that it offers some control of *Botrytis* and powdery mildew but little to no control of sour rot. Because of the modest results, particularly regarding sour rot, future trials will not be pursued.

Supporting attachments: none

Photo 1. Riesling grapes in Control treatment. Photo take October 4, 2022.



Photo 2. Riesling grapes in Treatment 2 (applied every 14 days; 6 total sprays). Notice the difference in appearance between the berries in the control treatment (Photo 1) and the berries with HydroShield applied to them.

