

NYWGF RESEARCH REPORT

Funding for fiscal year: 2025-2026

SECTION 1

Project title: Efficacy of strobilurin fungicides as alternatives to Ziram and Mancozeb for control of Phomopsis cane and leaf spot in the Lake Erie Region

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New Research **Continued Research**

Amount Funded \$ \$14,665 (\$5,000 NY Vineyard Fund at EJ Gallo, \$4,000 National Grape Coop, \$4,665 from NYWGF)

SECTION 2:

Project Summary Impact Statement:

Phomopsis cane and leaf spot is a major early-season disease of grapes in the Lake Erie region and beyond, capable of reducing yield by up to 30% in susceptible cultivars (Wilcox et al., 2015). The recent EPA cancellation of Ziram and potential loss of Mancozeb threatens effective disease management because these multisite fungicides are the foundation of current control programs. This project evaluated whether strobilurin fungicides (Abound and Sovran) could be repurposed to serve as effective alternatives since they are no longer recommended for powdery and downy mildews due to widespread resistance (Brown et al., 2024; Rotella et al., 2025). Because Phomopsis typically completes only a single infection cycle per season (Wilcox et al., 2015), the selection pressure for resistance development is lower than for polycyclic pathogens such as powdery and downy mildew, however resistance management strategies should still be implemented.

Two replicated field trials in Niagara and Concord vineyards demonstrated that both low and high label rates of Abound and Sovran provided disease control equivalent to Mancozeb across leaves, shoots, and clusters. These results confirm the 2024 trial results and provide growers with validated chemical alternatives and support updated regional disease management recommendations, improving sustainability and resilience of grape production in New York and Pennsylvania.

Objectives: This project addressed the industry's priority of disease and pest management by developing effective and sustainable disease control strategies that minimize resistance development and improve resilience to climate variability. There were two objectives.

Objective 1: Determine the efficacy of strobilurin fungicides (Abound and Sovran) in comparison to a water sprayed check, against Phomopsis cane and leaf spot.

Objective 2: Compare the efficacy of strobilurin fungicides (Abound and Sovran) with current standard fungicide Mancozeb (Ziram is no longer available on the market) against Phomopsis cane and leaf spot.

Materials & Methods: In spring of 2025, two fungicide trials were set up in mature vineyards (Concord and Niagara) at the Lake Erie Regional Grape Research and Extension Center, North East, PA. Vines were trained to a single curtain (no-tie) system. Treatments were applied to 6-8 vine plots in a randomized complete block design with 5 replicates (Concord) and 4 replicates (Niagara). Buffer vines were used between plots to minimize spray drift. Fungicide applications commenced at 0.5"-1" shoots and were repeated every 7-14 days through vine susceptibility. Fungicide applications were made with a backpack sprayer at 60 psi, beginning on 5 May 2025, applying 50 gal/A pre-bloom (two sprays), followed by 60 gal/A (three sprays), with the final application on 2 June 2025. Applications were preventative and hourly weather was recorded with an onsite weather station to determine the timing of infection periods and the severity of disease pressure for the 2025 growing season.

Trial 1: Five treatments were evaluated and compared on *Vitis labrusca* 'Niagara': i) Abound at the highest label rate, ii) Sovran at the highest label rate, iii) Sovran at the lowest label rate, iv) positive control: Manzate Pro-stick and v) negative control: water spray.

Trial 2: Six treatments were evaluated and compared on *Vitis labrusca* 'Concord': i) Abound at lowest label rate, ii) Abound at highest rate, iii) Sovran at lowest label rate, iv) Sovran at highest rate, v) positive control: Manzate Pro-stick, vi) negative control: water spray.

These trials enabled us to evaluate the whole range of activity of the strobilurins, Abound and Sovran, and to compare that to a typical full season Mancozeb program on Niagara and Concord grapes for Phomopsis control.

The incidence (% infected) and severity (% area infected) of Phomopsis were determined on the 4 most basal leaves and internodes of each of 10 primary shoots per plot. Downward oriented shoots under old wood (cordons) were targeted for disease assessment, as these shoots were likely to be the most challenged and severely affected tissues. The severity (% area infected) of disease on leaves was rated using the Barratt-Horsfall scale and converted to percent area infected using Elanco conversion tables.

Disease data was collected after June 30 (Niagara) and July 29 (Concord) and subjected to statistical analysis. Beta regression mixed modeling for severity data and mixed effects (binomial) models for incidence data with treatment as fixed effect and block as random effect were applied via glmmTMB package in R (v4.5.2). These models were followed with post hoc Tukey HSD tests via emmeans package in R to distinguish mean differences.

Results/Outcomes/Next Steps:

Fifty percent budbreak for Niagara and Concord grapevines occurred on April 25, 2025. Weather conditions during early shoot growth (May and early June) were not conducive to heavy *Phomopsis* development and disease was limited. May rainfall was above average in 2025, however rain periods were limited in terms of duration of leaf wetness and therefore, infection. Infection periods for Phomopsis did occur on May 4-5, 8, 23, and 29 and June 6, 9, 14, 19 and 27.

The results obtained in the Concord and Niagara trials indicate that the strobilurins, Abound and Sovran, at both low and high rates, were capable of maintaining significant control of this disease on leaves, shoots, and clusters equivalent to the use of the multisite inhibitor Mancozeb (Tables 1 and 2, and Figures 1, 2, and 3 below). Most importantly, shoot and cluster severity were reduced by approximately 75% across all fungicide treatments relative to the water control (Figure 3), demonstrating commercially meaningful disease suppression. Notably, low and high label rates of Abound and Sovran did not differ significantly, suggesting lower rates may provide economically viable control under low to moderate disease pressure. This is especially essential after the cancellation of Ziram and potentially Mancozeb.

Technology Transfer Plan: The results of these trials will be presented to extension and research colleagues at Penn State and Cornell Universities during the 2026 growing season.

Attachments:

Table 1: Concord Phomopsis Disease Summary

Treatment	Leaf Severity	Node Severity	Cluster Severity	Leaf Incidence	Node Incidence	Cluster Incidence
Abound Low (11 fl)	2.32a	5.77a	0.22a	72.9a	44a	7.14a

Treatment	Leaf Severity	Node Severity	Cluster Severity	Leaf Incidence	Node Incidence	Cluster Incidence
oz.)						
Abound High (15.5 fl oz.)	2.36a	5.24a	0.16a	74.11a	40.8a	7.14a
Sovran Low (3.2 fl oz.)	2.54a	4.75a	0.26a	74.51a	39.6a	9a
Sovran High (6.4 fl oz)	2.3a	5.34a	0.17a	72.9a	45.6a	7.53a
Manzate (3 lbs)	2.32a	6.19a	0.17a	69.24a	43.6a	7.78a
Water Control	4.91b	17.12b	1.31b	86.89b	65.6b	35.96b
P-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Severity was rated using the Barratt-Horsfall scale (0-11) and converted to % area infected (0-100 %) using Elanco conversion tables. Mean leaf, node, and cluster severity (Beta Regression Mixed Model, %) and incidence (Binomial Mixed Effects Model, %) of *Phomopsis* across fungicide treatments. Values represent model-estimated marginal means. Treatments sharing the same letter within a column are **not significantly different** based on Tukey's HSD test at $\alpha = 0.05$.

Figure 1

**Concord Trial: Disease Severity (Beta Regression Model) and
Disease Incidence (Mixed Effect Binomial Model) 95% Confidence Intervals**

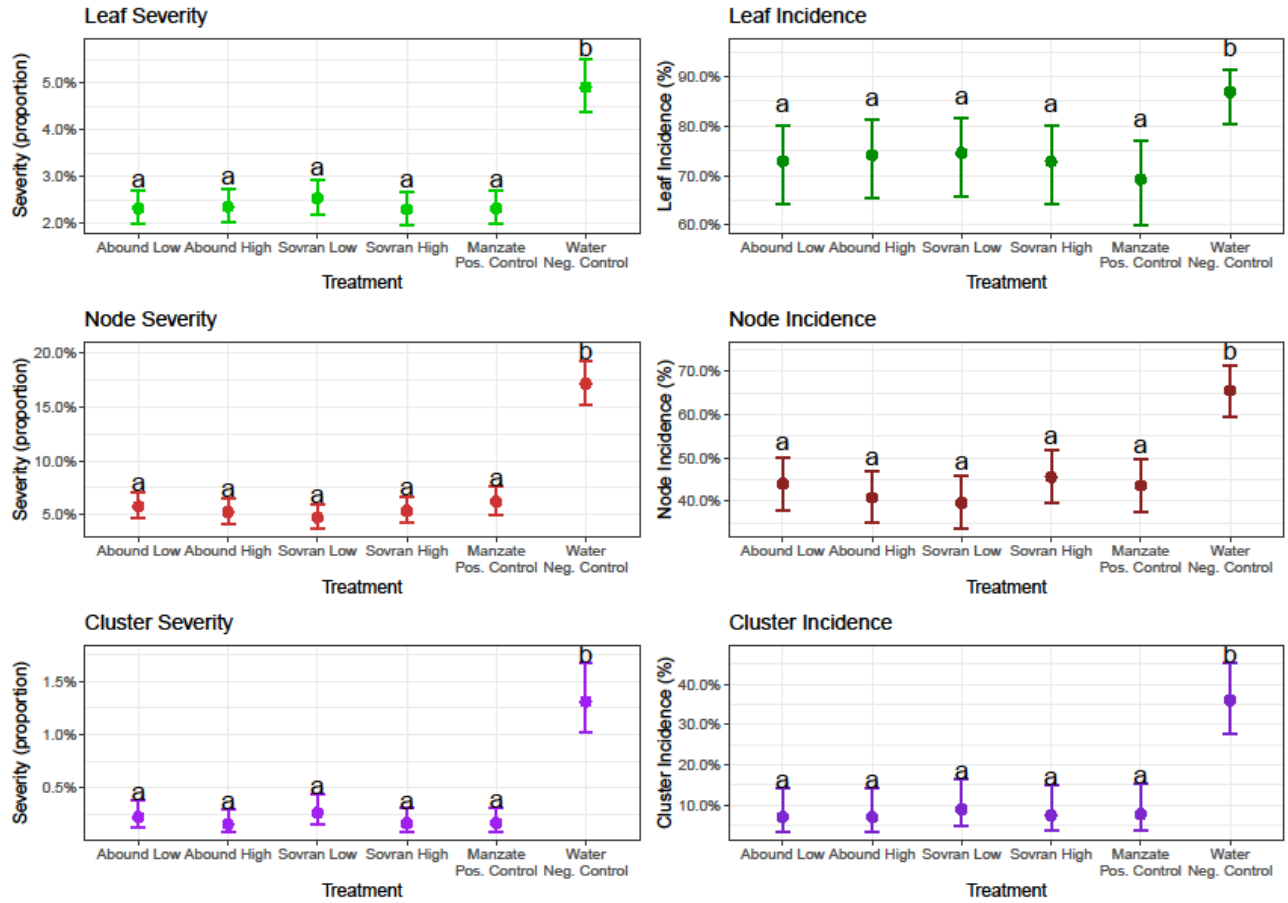


Table 2: Niagara Phomopsis Disease Summary

Treatment	Leaf Severity	Node Severity	Cluster Severity	Leaf Incidence	Node Incidence	Cluster Incidence
Abound High (15.5 fl oz.)	1.65a	1.48a	0.14a	65.67	37.07a	9.8
Sovran High (6.4 fl oz.)	1.55a	1.37a	0.37ab	62.64	33.98a	14.06
Sovran Low (3.2 fl oz.)	1.59a	1.34a	0.18a	63.65	43.28a	6.9
Manzate (3 lbs)	1.56a	0.96a	0.12a	62.14	30.9a	3.23
Water Control	2.25b	7.73b	0.79b	70.72	67.6b	20.97
P-value	<0.001	<0.001	<0.001	0.377	<0.001	0.0389

Severity was rated using the Barratt-Horsfall scale (0-11) and converted to % area infected (0-100 %) using Elanco conversion tables. Mean leaf, node, and cluster severity (Beta Regression Mixed Model, %) and incidence (Binomial Mixed Effects Model, %) of Phomopsis across fungicide treatments. Values represent model-estimated marginal means. Treatments sharing the same letter within a column are **not significantly different** based on Tukey's HSD test at $\alpha = 0.05$.

Figure 2

Niagara Trial: Disease Severity (Beta Regression Model) and Disease Incidence (Mixed Effect Binomial Model) 95% Confidence Intervals

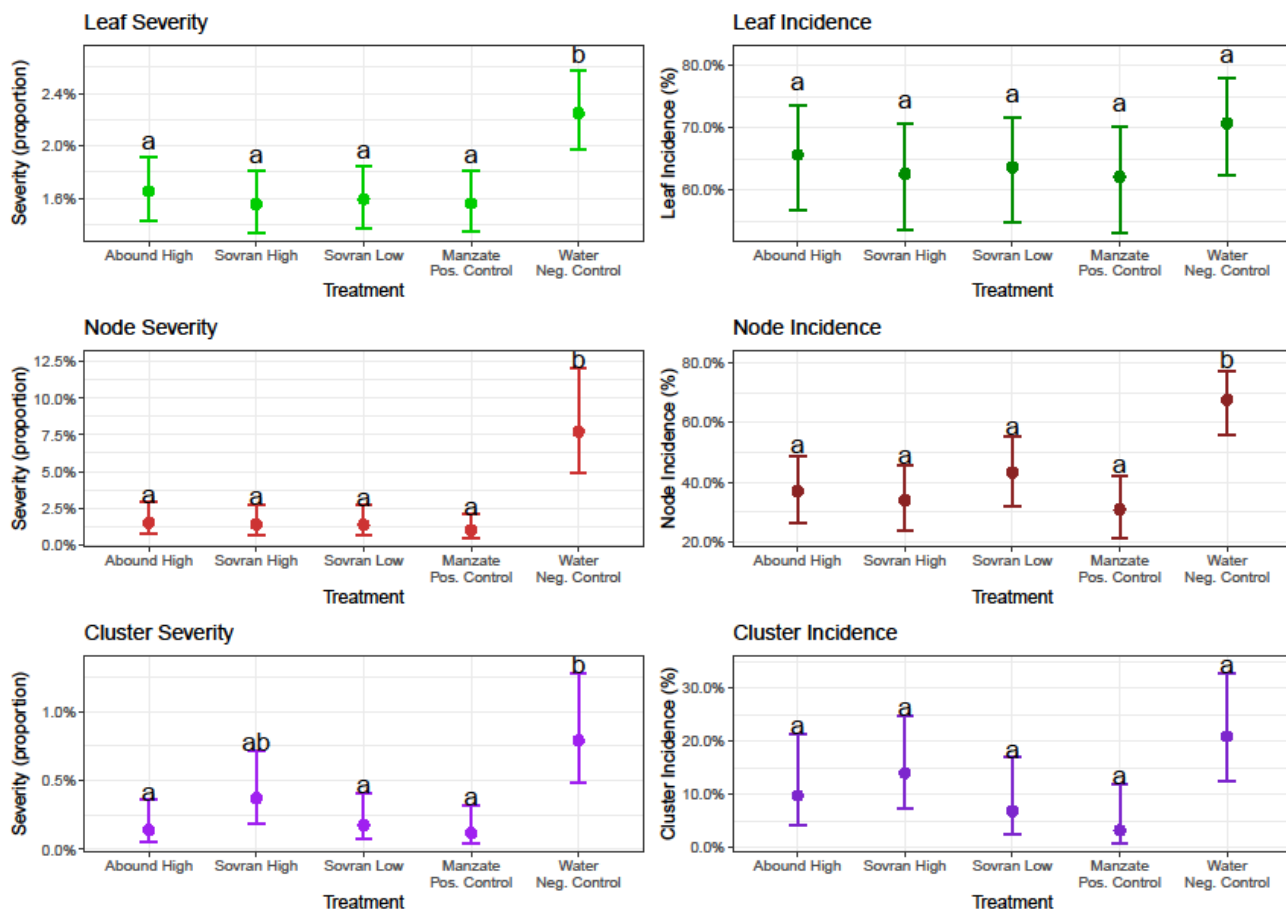
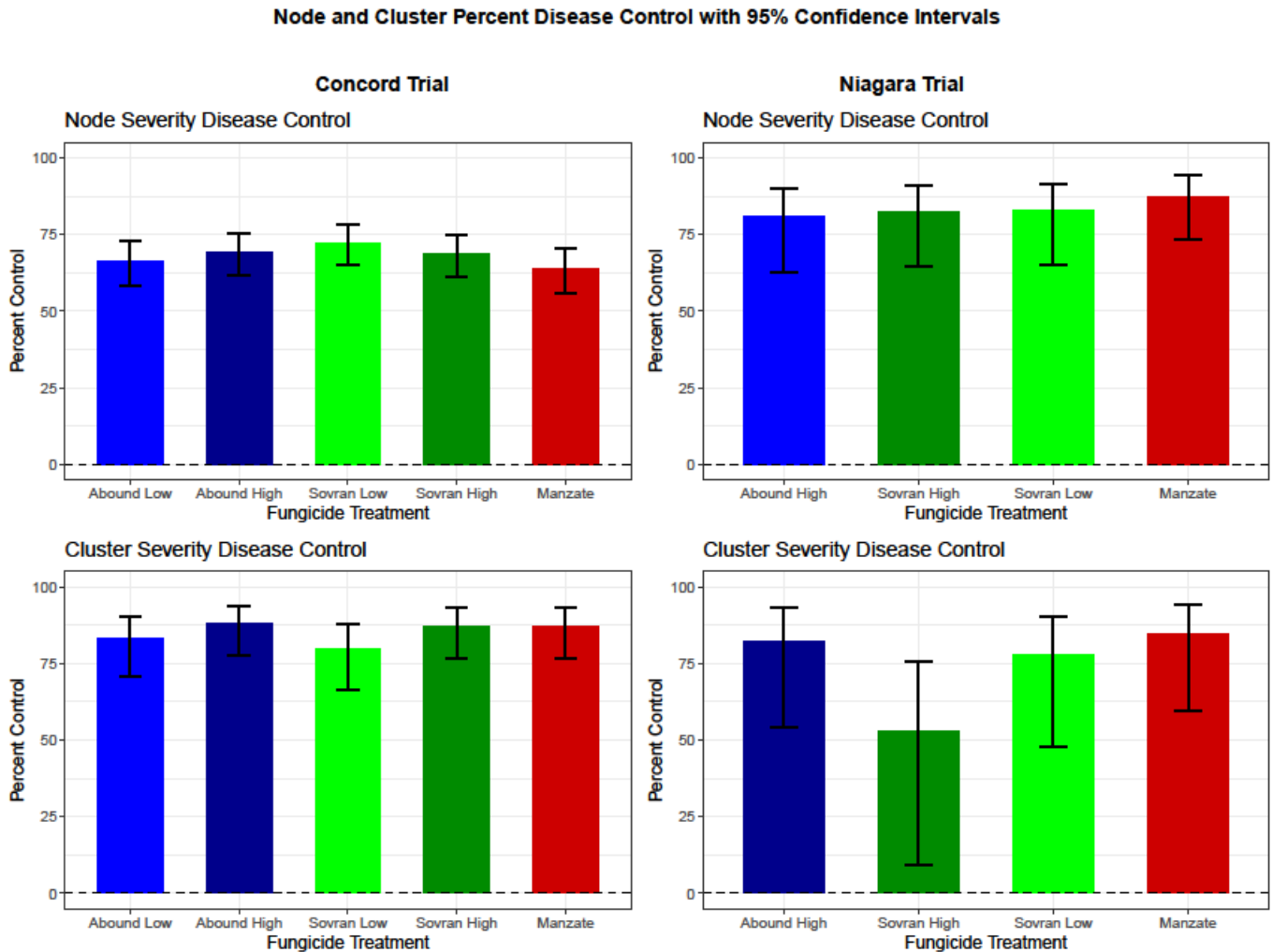


Figure 3



The percentage control of Phomopsis severity (% area of internodes 1-4) on shoots (nodes) and clusters on Concord and Niagara grapes.

SECTION 3:

Project summary and objectives:

Phomopsis cane and leaf spot is a major early-season disease of grapes in the Lake Erie region, capable of reducing yield by up to 30% in susceptible cultivars (Wilcox et al., 2015). The recent EPA cancellation of Ziram and potential loss of Mancozeb threatens effective disease management because these multisite fungicides are the foundation of current control programs. This project evaluated whether strobilurin fungicides (Abound and Sovran) could be repurposed to serve as effective alternatives since they are no longer recommended for powdery and downy mildews due to widespread resistance (Brown et al., 2024; Rotella et al., 2025).

Importance of research to the NY wine industry:

Two replicated field trials in Niagara and Concord vineyards demonstrated that both low and high label rates of Abound and Sovran provided disease control equivalent to Mancozeb across leaves,

shoots, and clusters. This is especially essential after the cancelation of Ziram and potentially Mancozeb. These results confirm the 2024 trial results across two consecutive growing seasons and provide growers with validated chemical alternatives and support updated regional disease management recommendations, improving sustainability and resilience of grape production in New York and Pennsylvania.

Project Results/next steps:

The results obtained in the Concord and Niagara trials combined with the 2024 trials indicate that the strobilurins, Abound and Sovran, at both low and high rates, were capable of maintaining significant control of Phomopsis disease on leaves, shoots, and clusters equivalent to the use of the multisite fungicide Mancozeb (Tables 1 and 2, and Figures 1, 2, and 3 below). Most importantly, on shoot and cluster severity all fungicide treatments control disease by nearly 75% (Figure 3). Low and high label rates of Abound and Sovran did not differ significantly, suggesting lower rates may provide economically viable control under low to moderate disease pressure.

The next steps in research could include the following:

- Multi-year validation under high disease pressure
- Resistance monitoring of Phomopsis populations
- Economic analysis of low vs high rate programs

Supporting attachments: See tables 1, 2 and figures 1, 2, 3 above. If only one figure can be used, figure 3 is recommended.

References:

- Rotella, S., Clippinger, J., Hed, B., Campbell, M., and Hu, M. 2025. Characterization of fungicide resistance in *Plasmopara viticola* isolates from Maryland and Pennsylvania vineyards. *Plant Disease*. In press.
- Brown, B., Gold, K., Hed, B., Helms, M., Loeb, G., and Sosnoskie, L. 2024. *New York and Pennsylvania pest management guidelines for grapes*. Cornell Cooperative Extension.
- Wilcox, W. F., Gubler, W. D., and Uyemoto, J. K. 2015. *Compendium of grape diseases, disorders, and pests*. 2nd ed. American Phytopathological Society.