

GRAPEVINE TRUNK DISEASE (GTD)

GTD is the most destructive disease complex in grapes, causing significant economic losses related to reduced yields, vine replacement and management costs. Worldwide estimates for the replacement cost of grapevines exceed \$1.5 billion per year. GTD is not caused by a single fungus, but by a complex of unrelated fungal pathogens that cause wood rot, cankers and plugging of the plant’s vascular system.

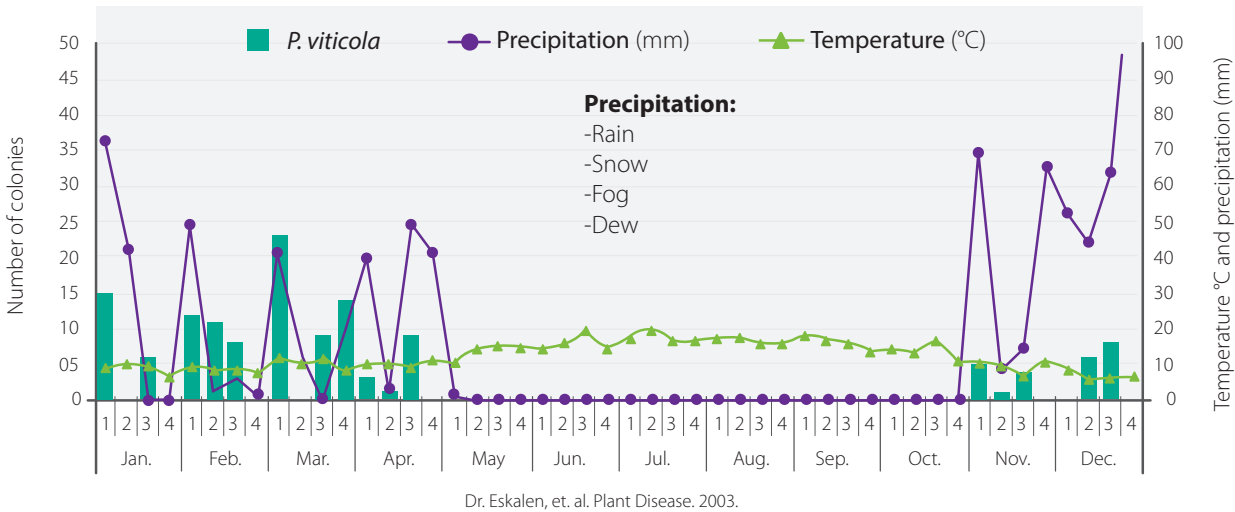
Impact on Vine Production:

- Experts estimate more than 80% of the grapevines in California are impacted by GTD.
- Yield losses can reach 94% in severely symptomatic vineyards.
- Yields can drop 70% by the time an infected vineyard is 15 years old, necessitating replanting.
- GTD often causes death of the grapevine within 20 years, shortening a vineyard’s typical productive lifespan of 25-30 years.

SUSCEPTIBILITY OF GTD

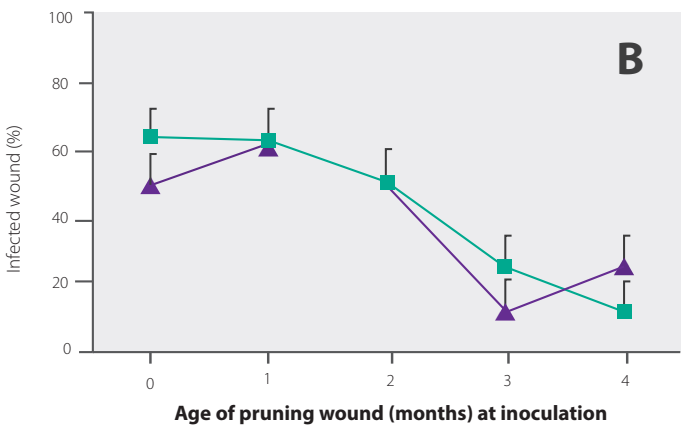
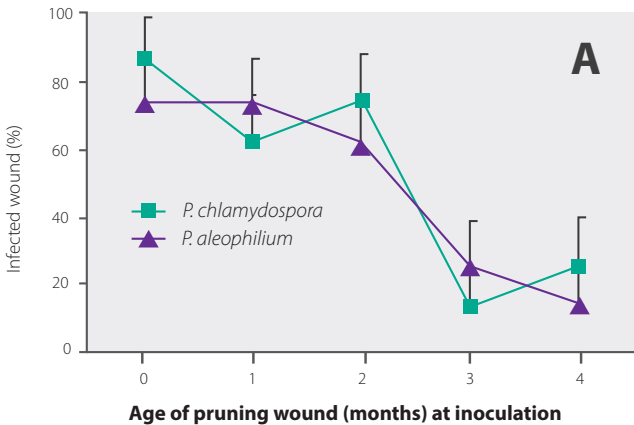
- More than 95% of trunk disease infections are associated with pruning or other cultural practices, such as mechanical harvesting.
- Pruning and harvesting practices can leave wounds exposed and open to infection by pathogens. The spread of the pathogens usually happens during rain events.
- These fungal pathogens grow and decay the xylem and phloem, slowly killing vines.
- Spore-producing bodies grow in dead vine wood.
- In the presence of water, spores are released and dispersed by wind to infect fresh pruning wounds.

SPORE OF THE GTD PATHOGENS DISPERSAL THROUGHOUT THE YEAR



PRUNING WOUND SUSCEPTIBILITY

Percentage of infected wound based on fungal re-isolation of A: Thompson Seedless and B: Cabernet Sauvignon grapevines as affected by age of pruning wound at inoculation with *Phaeomoniella chlamydospora* and *Phaeoacremonium aleophilum*.



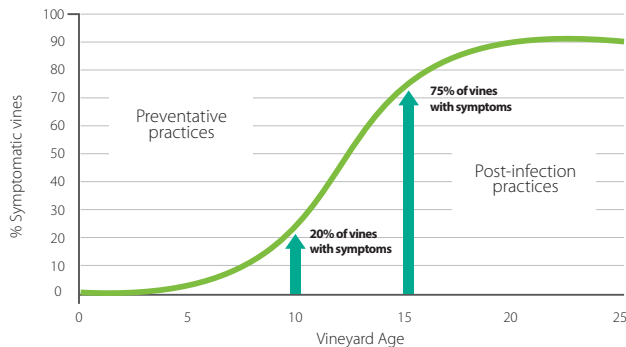
GRAPEVINE TRUNK DISEASE:

NOVEL RHYME® FUNGICIDE

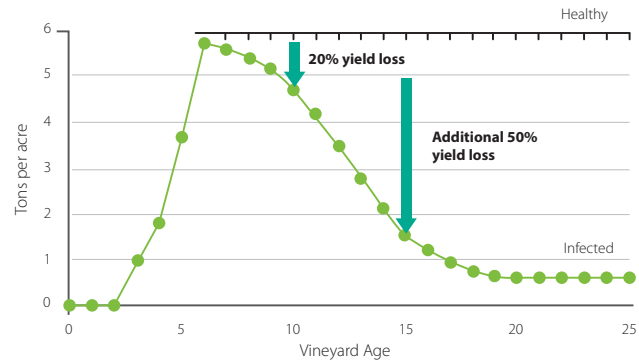
EARLY INTERVENTION TO PROTECT AGAINST YIELD LOSS

DISEASE INCIDENCE WITH VINE AGE

(% vines with dead spurs, stunted shoots, symptomatic leaves)



YIELD IMPACTS OF TRUNK DISEASES



(Munkvold et al., 1984 in Baumgartner et al., 2014)

WHY RHYME® FUNGICIDE?

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- One-man operation.
- Wide range of application methods thanks to its systemicity.
- Minimal exposure for workers.

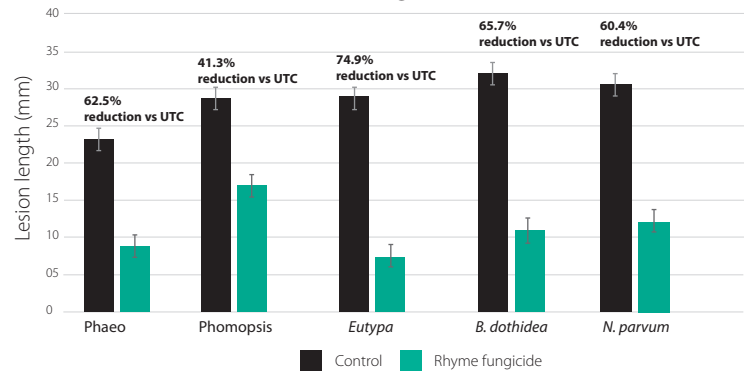
EASE OF APPLICATION

- Eliminate cost of some early-season foliar applications.
- Earlier application window post rain events.

USE RECOMMENDATIONS FOR GTD AND POWDERY MILDEW

- Use Rate: 5.0 fl. oz./A
- Application Timing: spring root flush, prior to veraison and at fall root flush.*
- Application Method: pressurized irrigation system.*
- PHI: 14 days.
- REI: 5 days for girdling and turning, and 12 hrs for other activities.

Lesion length (mm)



Florent Trouillas; Dept. of Plant Pathology, UC Davis 2020-2021. Parlier, CA.
Rhyme fungicide was injected at spring root growth, prior to veraison and at fall root growth.

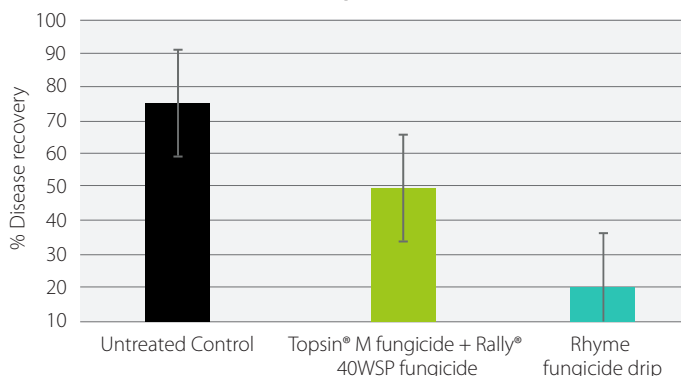
THE DRIP APPLICATION ADVANTAGE

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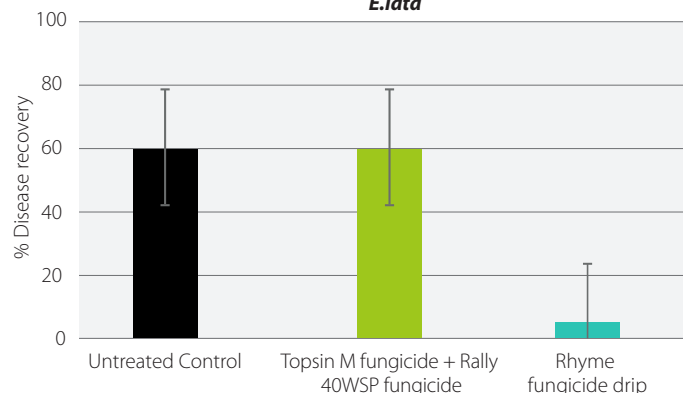
Rhyme fungicide will redefine GTD control following the issue of a 2(ee) recommendation for management of wood disease complex on grapes and tree nuts in California. Flutriafol, the active ingredient in Rhyme fungicide, the most systemic and longest lasting triazole on the market, is taken up by the roots and moves throughout the plant to provide both internal and foliar disease control.

Rhyme fungicide is the only fungicide labeled for application through drip application to control two of the most costly grape diseases: powdery mildew and GTD. An application by drip irrigation can save growers \$25-\$30 per acre for each foliar application eliminated.

N. parvum



E.lata



Akif Eskalen; Dept. of Plant Pathology, UC Davis, CA 2019. Rhyme fungicide was injected at spring root growth, prior to veraison and at fall root growth. Topsin M+Rally fungicides tank mix was applied 24-48 hours prior to inoculation.

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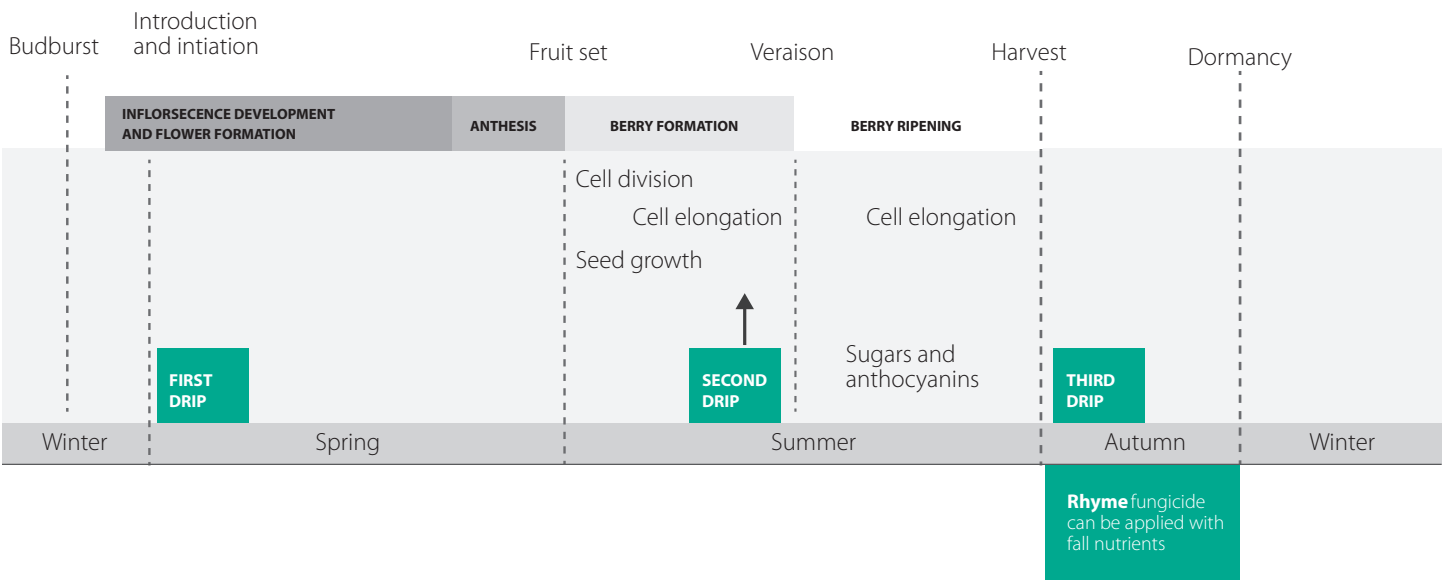
THE DRIP APPLICATION ADVANTAGE, CONT.

BACKED BY TRIAL DATA

Recent trials by the University of California and FMC have found Rhyme® fungicide, when applied via drip, controls a complex of pathogens responsible for destruction of the xylem tissue, which leads to grapevine decline and eventual death. Trials show that Rhyme fungicide applied via drip provides significantly better control of *Botryosphaeria* pathogens, *Eutypa lata*, *Phomopsis* and others than a tank-mix foliar treatment of Topsin® M and Rally® 40WSP fungicides in both young and established vineyards. It also provided better control of *Phomopsis* and canker. Besides using Rhyme fungicide via drip to manage GTD, growers should consider pruning infected cordons, sanitation, reducing plant stress and pruning vines when weather is not conducive for pathogen development.

RECOMMENDATIONS FOR WOOD DISEASES AND POWDERY MILDEW MANAGEMENT IN VINEYARDS USING RHYME FUNGICIDE

GRAPE:



This Rhyme fungicide recommendation is made as permitted under FIFRA Sections 2(ee) for the management of trunk disease complex on tree nuts in California. This recommendation has not been submitted to or approved by the EPA. The 2(ee) expiration date is 01/15/28.

This Rhyme fungicide recommendation is made as permitted under FIFRA Sections 2(ee) for the control of powdery mildew in grapes via drip chemigation. This recommendation has not been submitted to or approved by the EPA. The 2(ee) expiration date is 05/31/27.

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