



## Features and benefits

- Features multi-site biochemical modes of action which destroy pathogens from inside out and offers growers an excellent resistance management strategy
- Excellent food safety ratings with 0-day PHIs and exemptions from residue tolerance
- Provides high degree of worker safety with 4-hour REIs
- Excellent tank-mix and rotational partner
- No CODEX restrictions for international sales of treated commodities
- OMRI Listed
- Can be used for conventional and organic production

**SERENADE** 

**AGRAQUEST** 

AgraQuest, Inc.  
1540 Drew Avenue  
Davis, California 95618

**SERENADE** 

SERENADE® – It Just Works.

PROVEN SUPPRESSION OF EUTYPA ON GRAPES



## Some things just work.

Put a jolt in your IPM program with SERENADE®:

- Minimum REI
- Zero PHI
- Resistance management

SERENADE – It Just Works.

**AGRAQUEST** 

Innovative natural product solutions for pest management

[www.agraquest.com](http://www.agraquest.com)

Some things  
just work

# SERENADE<sup>®</sup>

## Active Ingredient in SERENADE<sup>®</sup> Helps Suppress Eutypa



The active ingredient in SERENADE<sup>®</sup> biofungicide, *Bacillus subtilis*, has demonstrated effective suppression of *Eutypa lata* on grapevine wood. Treating pruning wounds with SERENADE can stop the spread of the fungus and prevent grapevine dieback. Easily integrated into

your sustainable program, SERENADE has been proven effective against diseases that affect grapes such as Botrytis and Eutypa. Research on *Bacillus subtilis*<sup>'</sup> activity against *Eutypa lata* shows that:

- *Bacillus subtilis* offers effective control of *Eutypa lata* on grapevine wood, even following heavy inoculation;
- Providing nutrients in the solution with *Bacillus subtilis* increases activity against *Eutypa lata*.



### APPLICATION RATE RECOMMENDATIONS FOR SERENADE

Eutypa  
*Eutypa lata*

2% to 5% solution

Apply solution to pruning wounds. Sanitation is critical. All wood must be removed from the vineyard and destroyed (either buried or burned).

### Contact

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TABLE 1

| ANTAGONIST                                     | MYCELIAL GROWTH (%) <sup>1</sup>  |                          | REDUCTION OF MYCELIAL GROWTH (%) <sup>2</sup> |
|--|-----------------------------------|--------------------------|---|
|  | CONTROLS (UTC)<br>(ADDITIVE ONLY) | ANTAGONIST +<br>ADDITIVE |   |
| <i>Bacillus subtilis</i> B1α without additives | 96                                | 29                       | 70  |

Schmidt et al., 2001, J. Phytopathology. p. 437

<sup>1</sup>Mycelial growth on wood was assessed according a three-stage scale (0,50,100% coverage); values are means of three replicate plates, five wood pieces each.

<sup>2</sup>Reduction of mycelial growth significant at P<0.01 according to Dunnett's t-test

TABLE 2

| TEST TYPE              | SERENADE 3% | UTC |
|------------------------|-------------|-----|
| SAD* (In Vitro)        | 13.0 c      | 0 d |
| SAD/Stems** (In Vitro) | 100 e       | 0 a |

C. Yuan, & S. O'Brien. AgraQuest, Inc. In vitro evaluation of the efficacy of SERENADE and other new biopesticide candidates in controlling grape canker caused by Eutypa late. Phytopathology 92:S89

\*SAD=Standard agar diffusion; Mycelium inhibition zone (mm) was measured and compared (p<0.01) after 2 weeks of incubation. 10 replications were assigned for each treatment;

\*\*Efficacy (%) was measured for mycelium coverage on stems and compared with water treated control after 5 weeks of incubation (p<0.01).

5 replications were assigned for each treatment.

Results of the SAD (standard agar diffusion) assay indicated that SERENADE at 3% resulted in significant inhibition of mycelia growth after 10 days of incubation.

Assay with grape stems indicated that SERENADE showed significant efficacy against the Eutypa pathogen compared with untreated controls. The discovery of the efficacy of SERENADE provides potential means to combat this disease using reduced risks crop production products.

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Can be used for Conventional & Organic Production

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