

# A21-012-890FE

## Efficacy of ozone applied alone and in mix against Botrytis cinerea on grape. Italy 2021

Trial ID: A21-012-890FE Location: Italy Trial Year: 2021  
Protocol ID: 890A21FE8 Investigator (Creator): Lorenzo Alvoni  
Project ID: Study Director: Antonio Russo  
Official Trial ID: A21-012-890FE Sponsor Contact: Federico Ponti  
Trial Origin: C contracted trial

## TREATMENT LIST

| Trt No. | Type | Treatment Name  | Form Conc | Form Unit | Form Type | Description   | Rate    | Rate Unit | Appl Code | Comment 1     | Comment 2                             |
|---------|------|-----------------|-----------|-----------|-----------|---------------|---------|-----------|-----------|---------------|---------------------------------------|
| 1       | CHK  | Untreated Check |           |           |           |               |         |           |           |               |                                       |
| 2       | FUNG | Ozone           |           |           | SN        |               | 5ppm pr |           | ABCD      | 500-1200 L/ha | Spray application with water          |
| 3       | FUNG | Serenade ASO    | 14,1      | g/L       | WG        |               | 4l/ha   |           | ABCD      | 500-1200 L/ha |                                       |
| 4       | FUNG | Ozone           |           |           | SN        |               | 5ppm pr |           | ABCD      | 500-1200 L/ha | Apply Serenade ASO after Ozone        |
|         | FUNG | Serenade ASO    | 14,1      | g/L       | WG        |               | 4l/ha   |           | ABCD      | 500-1200 L/ha | on dry leaves                         |
| 5       | FUNG | Ozone           |           |           | SN        |               | 5ppm pr |           | ABCD      | 500-1200 L/ha | Ozone spray application in emulsified |
|         | FUNG | Sunflower oil   |           |           | EC        | Rate 1-5 %V/V | 1% v/v  |           | ABCD      | 500-1200 L/ha | sunflower oil with water              |
| 6       | FUNG | Sunflower oil   |           |           | EC        | Rate 1-5 %V/V | 1% v/v  |           | ABCD      | 500-1200 L/ha | Spray application                     |

## OBJECTIVES

### Objectives:

**Do the Ozone used alone have efficacy comparable to the standard Serenade Aso?**

- Does the addition of Ozone to the standard Serenade Aso increase the efficacy of Serenade Aso used alone?
- Does the addition of Ozone emulsified Sunflower oil increase the efficacy of Ozone used alone?
- Are all treatments safe for the crop?

# SITE DESCRIPTION

| Trial Location             |                 |                      |                           |
|----------------------------|-----------------|----------------------|---------------------------|
| <b>Address (Location):</b> | Via L. Da Vinci |                      |                           |
| <b>City:</b>               | Cona            | <b>Country:</b>      | ITA Italy                 |
| <b>State/Prov.:</b>        | Venezia VE      | <b>Region:</b>       | Veneto                    |
| <b>Postal Code:</b>        | 30010           | <b>Climate Zone:</b> | EPOMED EPPO Mediterranean |

| Crop Description           |                        |                            |                               |
|----------------------------|------------------------|----------------------------|-------------------------------|
| <b>Crop 1:</b>             | C VITVI Vitis vinifera | European Grape             | <b>BBCH Scale:</b> BGRA       |
| <b>Entry Date:</b>         | Aug-23-2021            | <b>Stage Scale:</b>        | BBCH                          |
| <b>Variety:</b>            | Glera                  |                            |                               |
| <b>Perennial Age:</b>      | 8 YR                   | <b>Planting Density:</b>   | 2564 P/ha                     |
| <b>Rows per Plot:</b>      | 1                      | <b>Planting Method:</b>    | TRAMAC transplanted - machine |
| <b>Row Spacing:</b>        | 3 m                    | <b>Planting Equipment:</b> | MT transplanter, mechanical   |
| <b>Spacing within Row:</b> | 1,3 m                  | <b>Soil Moisture:</b>      | GOOD good                     |
|                            |                        | <b>Plant Arrangement:</b>  | ROW                           |

| Pest Description    |                      |                     |                          |
|---------------------|----------------------|---------------------|--------------------------|
| <b>Pest 1 Type:</b> | D                    | <b>Code:</b> BOTRCI | Botrytis cinerea         |
| <b>Common Name:</b> | Brownish-grey mildew |                     | <b>Stage Scale:</b> BBCH |

| Site and Design               |                     |                           |   |
|-------------------------------|---------------------|---------------------------|---|
| <b>Treated Plot Width:</b>    | 3 m                 | <b>Total Plot Width:</b>  | 3 m   |
| <b>Treated Plot Length:</b>   | 13 m                | <b>Total Plot Length:</b> | 13 m  |
| <b>Treated Plot Area:</b>     | 39,0 m <sup>2</sup> | <b>Treatments:</b>        | 6   |
| <b>Replications:</b>          | 4                   | <b>Site Type:</b>         | FIELD field                                 |
| <b>% Slope:</b>               | 0                   | <b>Experimental Unit:</b> | 1 PLOT plot                                 |
| <b>Untreated Arrangement:</b> | INCLUDED            | <b>Tillage Type:</b>      | CONTIL conventional-till                    |
| <b>Block Arrangement:</b>     | BSSPSS              | <b>Study Design:</b>      | RACOB� Randomized Complete Block (RCB)      |
|                               |                     |                           | single control randomized in each block     |
|                               |                     |                           | all blocks side by side, plots side by side |

| Soil Description      |        |                     |                      |
|-----------------------|--------|---------------------|----------------------|
| <b>% Sand:</b>        | 13     | <b>% OM:</b>        | 0,7                  |
| <b>% Silt:</b>        | 56     | <b>pH:</b>          | 8,5                  |
| <b>% Clay:</b>        | 31     | <b>Texture:</b>     | SICL silty clay loam |
| <b>Soil Drainage:</b> | G good | <b>Soil Name:</b>   | silty clay loam      |
|                       |        | <b>Fert. Level:</b> | G good               |

| Application Description                |             |             |             |             |
|--|-------------|-------------|-------------|-------------|
|  | A           | B           | C           | D           |
| <b>Application Date</b>                | Jun-10-2021 | Jun-30-2021 | Aug-11-2021 | Aug-30-2021 |
| <b>Appl. Start Time</b>                | 9:30        | 10:00       | 15:00       | 11:00       |
| <b>Appl. Stop Time</b>                 | 10:30       | 11:00       | 16:00       | 12:00       |
| <b>Interval to Prev. Appl.</b>         |             | 20 DAYS     | 42 DAYS     | 19 DAYS     |
| <b>Application Method</b>              | BROADC      | BROADC      | BROADC      | BROADC      |
| <b>Application Timing</b>              | ACCRST      | ACCRST      | ACCRST      | ACCRST      |
| <b>Application Placement</b>           | FOLIAR      | FOLIAR      | FOLIAR      | FOLIAR      |
| <b>Applied By</b>                      | L. Alvoni   | L. Alvoni   | L. Alvoni   | L. Alvoni   |
| <b>Appl. Entry Date</b>                | Aug-23-2021 | Aug-24-2021 | Aug-24-2021 | Sep-29-2021 |
| <b>Air Temperature Start, Stop</b>     | 23; 23 C    | 27; 27 C    | 33; 33 C    | 30; 30 C    |
| <b>% Relative Humidity Start, Stop</b> | 47; 47      | 40; 40      | 38; 38      | 42; 42      |
| <b>Wind Velocity+Dir. Start</b>        | 0 MPS; -    | 1 MPS; N    | 0 MPS; -    | 0 MPS; -    |
| <b>Wind Velocity+Dir. Stop</b>         | 0 MPS; -    | 1 MPS; N    | 0 MPS; -    | 0 MPS; -    |
| <b>Wind Velocity+Dir. Max</b>          | 0 MPS; -    | 1 MPS; N    | 0 MPS; -    | 0 MPS; -    |
| <b>Wet Leaves (Y/N)</b>                | N; no       | N; no       | N; no       | N; no       |
| <b>Soil Temperature</b>                | 21 C        | 25 C        | 22 C        | 21 C        |
| <b>Soil Moisture</b>                   | NORMAL      | DRY         | DRY         | DRY         |
| <b>Soil Surface Condition</b>          | FINE        | FINE        | FINE        | FINE        |
| <b>% Cloud Cover</b>                   | 60          | 0           | 20          | 5           |
| <b>Next Moisture Occurred On</b>       | Jun-11-2021 | Jul-2-2021  | Aug-29-2021 | Aug-31-2021 |
| <b>Time to Next Moisture</b>           | 1,0 DAY     | 2,0 DAY     | 18,0 DAY    | 1,0 DAY     |
| <b>Moisture 6 Hours after Appl.</b>    | 0 mm        | 0 mm        | 0 mm        | 0 mm        |
| <b>Moisture 1 Week after Appl.</b>     | 0,2 mm      | 37 mm       | 6,2 mm      | 0,6 mm      |
| <b>Weather Source</b>                  | WSLOCAL     | WSLOCAL     | WSLOCAL     | WSLOCAL     |

## Comment:

In trt. 3 , trt. 4, trt. 5 and trt. 6 the standard product was applied by means of knapsack sprayer #188.

Operation pressure: 4 BAR

Nozzle Type: Hollow Cone

Nozzle size: 02

Nozzle spacing: 7 cm

Nozzle/Row: 3

Nozzle calibration: 3070 mL/MIN

Time of application:

- Appl. A: 61.0
- Appl. B: 76.2
- Appl. C: 76.2
- Appl. D: 76.2

·  
· **Protocol Application Directions:**

· **Time and frequency of application**

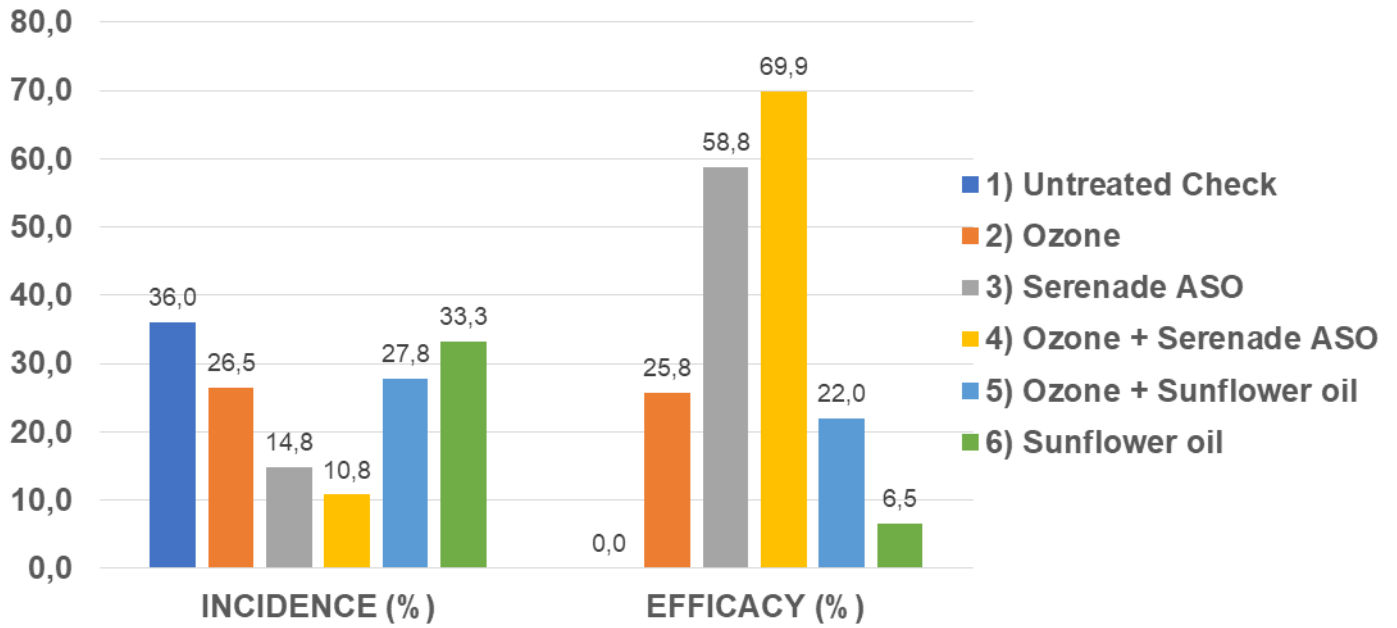
- A: Full flowering (BBCH 65)
- B: Berries begin to hang (BBCH 73)
- C: Berries developing colour (BBCH 83)
- D: 10-14 days before harvest

· **Doses and volumes**

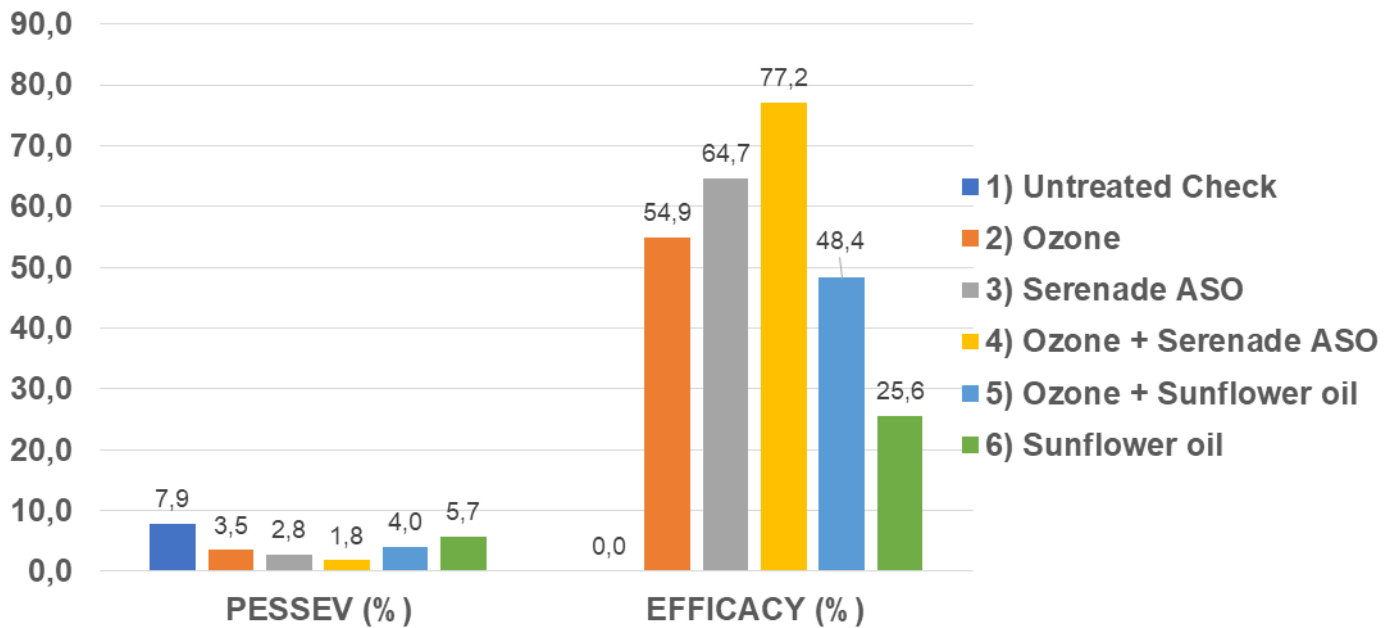
- Use water volume variable following crop growth: 500-1200 L/ha

# RESULTS

## Incidence on bunches – 14 days after last application



## Severity on bunches – 14 days after last application



## COMMENTS

**English version:** At the end of the experimental program for the control of *Botrytis cinerea* on grape, during which 4 applications were carried out based on susceptibility moments of the crop, the untreated check showed a disease severity on bunches equal to 7.90% with an incidence equal to 36.0%. All the products tested in field showed significant results if compared to the untreated check regarding the pest severity and pest incidence. The best result on bunches, was showed by the reference product Serenade ASO applied in strategy with Ozone with 69.9% of control comparable to the standard Serenade ASO applied alone that showed 58.8% of efficacy. Different from the previous ones, Ozone applied alone, with 25.8% of control was comparable to the strategy of Ozone with Sunflower oil (with 22.0%). The addition of Ozone increase the efficacy of Serenade ASO although not statistically significant. The addition of Ozone emulsified Sunflower oil, do not increase the efficacy of Ozone applied alone.

**Versione italiana:** Al termine della strategia sperimentale per il controllo di *Botrytis cinerea* su vite, durante la quale sono state realizzate 4 applicazioni, basate sui momenti di suscettibilità della coltura, il testimone non trattato ha mostrato una severità della malattia sui grappoli pari al 7.90% con una incidenza pari al 36.0%. Tutti i prodotti applicati in campo hanno fornito risultati significativi rispetto al testimone per quanto riguarda la severità e l'incidenza della malattia. Il miglior risultato sui grappoli è stato fornito dal prodotto di riferimento Serenade ASO applicato in strategia con Ozono con il 69.9% di controllo comparabile allo standard Serenade ASO applicato da solo con il 58.8% di efficacia. Differente dai precedenti, Ozono applicato da solo, con il 25.8% di controllo, era comparabile con la strategia di Ozono con Sunflower oil (con 22.0%). L'aggiunta di Ozono incrementa l'efficacia di Serenade ASO sebbene non sia statisticamente significativa. L'aggiunta di Ozono emulsionato con Sunflower oil, non aumenta l'efficacia di Ozono applicato da solo.

## CONCLUSION

**Conclusions:**

**English version:** Within the test aimed at controlling *Botrytis cinerea* on grape with the use of organic products, Ozone alone showed efficacy in reducing the disease severity and incidence on bunches compared to the untreated check. Ozone in strategy with the standard Serenade ASO showed the best control of the disease comparable to the standard applied alone. No symptoms of phytotoxicity were observed.

**Versione italiana:** All'interno della prova volta al controllo di *Botrytis cinerea* su vite con utilizzo di prodotti biologici, l'Ozono da solo ha mostrato efficacia nel ridurre la severità e l'incidenza della malattia sui grappoli rispetto al non trattato. Ozono in strategia con lo standard Serenade ASO ha mostrato il miglior controllo della malattia comparabile allo standard applicato da solo. Non si sono osservati sintomi di fitotossicità.

## CONTACTS

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