

# AES21-009-890FE

## Efficacy of ozone applied alone and in mix, against Oidium sp. on Pepper. Spain 2021

Trial ID: AES21-009-890FE Location: Spain Trial Year: 2021  
Protocol ID: 890A21FE2 Investigator (Creator): Daniel Tamarit Latorre  
Project ID: Study Director: Francesco Valli  
Official Trial ID: 890A21FE2 Sponsor Contact: Giulio Senese - MET Srl  
Trial Origin: C contracted trial

## TREATMENT LIST

Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Registration Number	Other Rate	Other Unit	Appl Code	Comment
1	CHK	Untreated Check								
2	FUNG	Ozone			SN		5ppm pr		ABCDEF	Spray application with water
3	FUNG	Serenade ASO	14,1	g/L	SC	ES-00154	8l/ha		ABCDEF	Spray application
4	FUNG	Ozone			SN		5ppm pr		ABCDEF	
	FUNG	Serenade ASO	14,1	g/L	SC	ES-00154	8l/ha		ABCDEF	Apply Serenade ASO after Ozone on dry leaves
5	FUNG	Ozone			SN		5ppm pr		ABCDEF	Ozone spray application in emulsified sunflower oil with water
	FUNG	Sunflower oil			EC		1% v/v		ABCDEF	
6	FUNG	Sunflower oil			EC		1% v/v		ABCDEF	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

**Address (Location):** Partida Ciperet s/n  
**City:** Meliana **Country:** ESP Spain  
**State/Prov.:** València V **Region:** C. Valenci  
**Postal Code:** Meliana **Climate Zone:** EPOMED EPPO Mediterranean

### Crop Description

**Crop 1:** CPSAN Capsicum annum Bell Pepper **BBCH Scale:** BVSO  
**Entry Date:** 19-8-21 **Crop Group:** 8 **Stage Scale:** BBCH  
**Variety:** Medrano  
**Planting Date:** 15-3-21 **Natural Crop Population:** N no  
**Depth:** 5 cm **Planting Rate:** 20 P/PLOT  
**Rows per Plot:** 2 **Planting Density:** 20000 P/ha  
**Row Spacing:** 1 m **Planting Method:** TRAHAN transplanted - hand  
**Spacing within Row:** 0,5 m **Planting Equipment:** HA by hand  
**Seed Bed:** MEDIUM medium  
**Soil Moisture:** GOOD good  
**Plant Arrangement:** ROW

### Pest Description

**Pest 1 Type:** D **Code:** ODISP Oidium sp. **Entry Date:** 3-9-21  
**Common Name:** Oidium sp. **Stage Scale:** BBCH  
**Crop:** 1 CPSAN **Artificial Population:** N no

### Site and Design

**Treated Plot Width:** 2 m **Total Plot Width:** 2 m **Site Type:** GREENH greenhouse  
**Treated Plot Length:** 5 m **Total Plot Length:** 5 m **Experimental Unit:** 1 PLOT plot  
**Treated Plot Area:** 10,0 m<sup>2</sup> **Treatments:** 6 **Tillage Type:** CONTIL conventional-till  
**Replications:** 4 **Study Design:** RACOBL Randomized Complete Block (RCB)  
**% Slope:** 0 **Plots arranged as in field?:** Y yes **Exposure:** North

**Untreated Arrangement:** INCLUDED single control randomized in each block  
**Block Arrangement:** BUPPSS all blocks lying upon each other, plots side by side  
**Distance between Blocks:** 0 m

### Soil Description

**% Sand:**67,4    **% OM:**1,7    **Texture:**SL sandy loam  
**% Silt:**18,2    **pH:**8,1  
**% Clay:**15,1    **CEC:**10,6    **Fert. Level:**G good

### Application Description

	A	B	C	D	E	F	G	H
<b>Application Date</b>	20-4-21	27-4-21	4-5-21	11-5-21	18-5-21	25-5-21	1-6-21	8-6-21
<b>Appl. Start Time</b>	11:00	11:30	9:00	9:30	10:00	8:45	8:15	9:30
<b>Appl. Stop Time</b>	12:00	12:30	10:00	10:30	11:00	10:00	9:00	10:30
<b>Interval to Prev. Appl.</b>		7 DAYS	7 DAYS	7 DAYS	7 DAYS	7 DAYS	7 DAYS	7 DAYS
<b>Application Method</b>	BROADC	BROADC	BROADC	BROADC	BROADC	BROADC	BROADC	BROADC
<b>Application Timing</b>	PREVEN	FIINSP	FIINSP	FIINSP	FIINSP	FIINSP	FIINSP	FIINSP
<b>Application Placement</b>	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR
<b>Applied By</b>	D. Tamarit	D. Tamarit	D. Tamarit	D. Tamarit	D. Tamarit	D. Tamarit	D. Tamarit	D. Tamarit
<b>Appl. Entry Date</b>	24-8-21	24-8-21	24-8-21	24-8-21	24-8-21	24-8-21	24-8-21	24-8-21
<b>Air Temperature Start, Stop</b>	18,5; - C	19,8; - C	18,8; - C	20,1; - C	23,5; - C	20,7; - C	22,3; - C	26,1; - C
<b>% Relative Humidity Start, Stop</b>	70,1; -	65,3; -	68,2; -	67,3; -	55,5; -	72,1; -	66,3; -	59,3; -
<b>Wind Velocity+Dir. Start</b>	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -
<b>Wet Leaves (Y/N)</b>	N; no	N; no	N; no	N; no	N; no	N; no	N; no	N; no
<b>Soil Temperature</b>	10,2 C	13,4 C	11,3 C	11,9 C	16,8 C	16,2 C	19,2 C	21,3 C
<b>Soil Moisture</b>	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
<b>Soil Surface Condition</b>	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
<b>Next Moisture Occurred On</b>	21-4-21	30-4-21	9-5-21	23-5-21	23-5-21	1-6-21	5-6-21	9-6-21
<b>Time to Next Moisture</b>	1,0 DAY	3,0 DAY	5,0 DAY	12,0 DAY	5,0 DAY	7,0 DAY	4,0 DAY	1,0 DAY
<b>Moisture 6 Hours after Appl.</b>	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm
<b>Moisture 1 Week after Appl.</b>	43 mm	0,2 mm	6,5 mm	0 mm	15,1 mm	2,2 mm	8,3 mm	0,6 mm
<b>Weather Source</b>	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL

**Comment:**

Time to treat 1 plot:

- Appl. A: 17.8 s
- Appl. B: 17.5 s
- Appl. C: 22.3 s
- Appl. D: 22.2 s
- Appl. E: 21.8 s
- Appl. F: 21.4 s
- Appl. G: 22.6 s
- Appl. H: 22.2 s

**Protocol Application Directions:**

**Time and frequency of application**

- A: BBCH 51
- B: BBCH 55
- C: BBCH 59
- D: BBCH 61
- E: BBCH 65
- F: BBCH 69
- G: BBCH 72-81
- H: BBCH 73-82

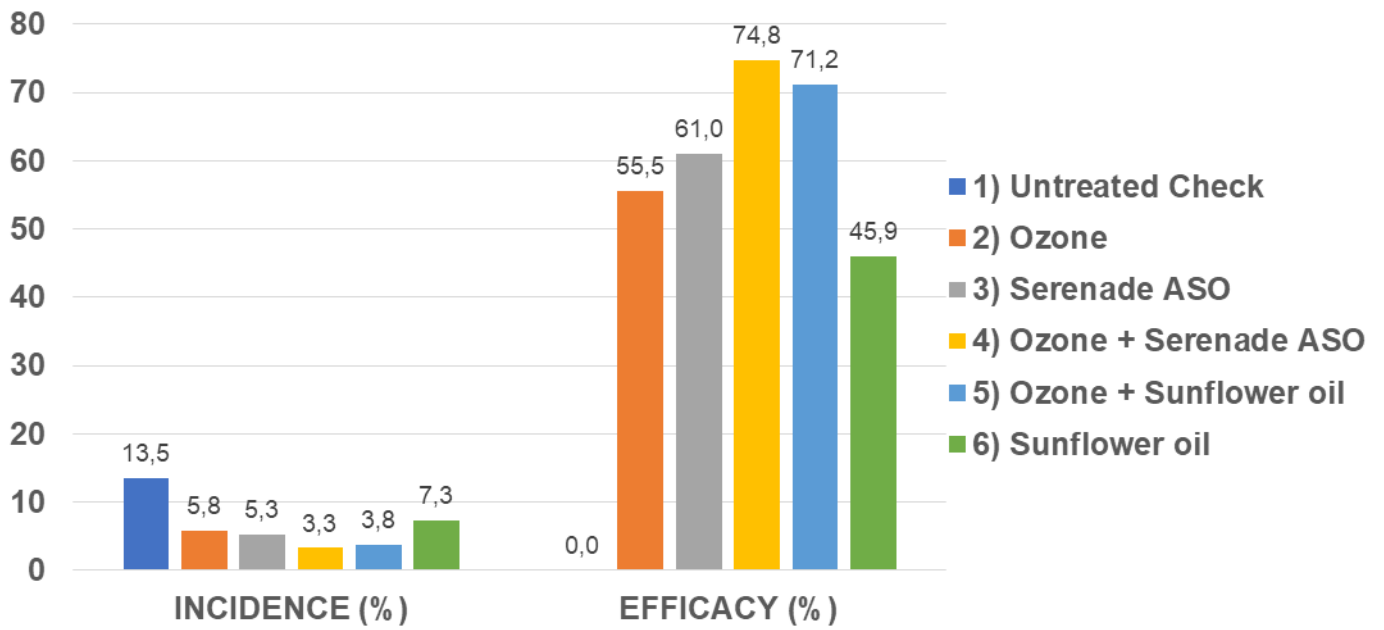
Minimum spray interval: 5-7 days.

**Doses and volumes**

Use water volume variable following crop growth: 300-1000 L/ha

# RESULTS

## On leaves – 10 Days after last application



## COMMENTS

**English version:** At the end of the experimental program for the control of *Oidium sp.* on pepper, during which 8 applications were carried out based on susceptibility moments of the crop, the untreated check provided an incidence of 13.5% on leaves, with a consequent damage to the yield. All the products tested in field showed significant results if compared to the untreated check. The best result is showed by the Ozone applied in strategy with the standard Serenade ASO which reduced the *Oidium sp.* damage to 3.3% corresponding to 74.8% of control. Comparable to the previous one, Ozone applied with Sunflower oil emulsified showed 3.8% of incidence (71.2% of control). The standard Serenade ASO applied alone showed a value of pest incidence equal to 5.3% (60.9%), comparable to the previous one but also with Ozone applied alone with 5.8% (55.5% of control). The lower efficacy was showed by Sunflower oil applied alone, which showed 7.3% of incidence (45.9% of control). No damage on fruits were observed.

**Versione italiana:** Al termine del programma sperimentale per il controllo di *Oidium sp.* su peperone, durante la quale sono state realizzate 8 applicazioni basate sui momenti di suscettibilità della coltura, il testimone non trattato ha mostrato un'incidenza su foglie uguale a 13.5%, con un conseguente danno alla resa. Tutti i prodotti testati in campo hanno fornito risultati significativi se comparati con il non trattato. Il miglior risultato è stato mostrato dal trattamento con Ozono applicato in strategia con lo standard Serenade ASO, che ha ridotto il danno da *Oidium sp.* al 3.3% corrispondente al 74.8% di controllo. Comparabile al precedente, Ozono applicato in emulsione con Sunflower oil ha mostrato una incidenza pari a 3.8% (71.2% di controllo). Lo standard Serenade ASO da solo ha mostrato una incidenza pari a 5.3% (60.9%), comparabile al precedente ma anche con Ozono applicato da solo con 5.8% (55.5% di controllo). L'efficacia più bassa, è stata mostrata da Sunflower oil applicato da solo che ha mostrato 7.3% di incidenza (45.9% di controllo). Non sono stati osservati danni sui frutti.

## CONCLUSIONS

**English version:** Within the test aimed at controlling *Oidium sp.* on pepper with the use of organic products, Ozone showed efficacy on leaves. Ozone in strategy with Serenade ASO contributes to an improvement of the efficacy of the standard product as well as the application of Ozone in emulsified Sunflower oil and showed the higher disease control and comparable among themselves. Ozone applied alone showed efficacy comparable to the standard Serenade ASO applied alone. No symptoms of phytotoxicity were observed. Sunflower oil applied alone showed less efficacy than the rest of the treatments.

**Versione italiana:** durante la prova per il controllo di *Oidium sp.* su peperone, con l'utilizzo di prodotti biologici, l'Ozono ha mostrato efficacia su foglia. L'ozono in strategia con Serenade ASO contribuisce a un miglioramento dell'efficacia del prodotto standard allo stesso modo, l'applicazione di Ozono in emulsione con Sunflower oil e hanno mostrato il più alto controllo della malattia e comparabile fra loro. Ozono applicato da solo ha mostrato una efficacia comparabile allo standard Serenade ASO applicato da solo. Non sono stati osservati sintomi di fitotossicità. L'olio di girasole applicato da solo ha mostrato minore efficacia rispetto al resto dei trattamenti.

## CONTACTS

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