

A21-020-890FE

Efficacy of ozone applied alone and in mix, against Botrytis sp. and Sclerotinia sp. on transplanted lettuce. Italy 2021

Trial ID:	A21-020-890FE	Location:	Italy	Trial Year:	2021
Protocol ID:	890A21FE5	Investigator (Creator):	Michele Rugiano		
Project ID:		Study Director:	Antonio Russo		
Official Trial ID:	A21-020-890FE	Sponsor Contact:	Giulio Senese - MET Srl		
Conducted Under GEP:	Yes	Trial Origin:	C contracted trial		

TREATMENT LIST

Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Other Rate	Other Rate Unit	Appl Code	Comment 1	Comment 2
1	CHK	Untreated Check								
2	FUNG	Ozone			SN	3 ppm pr		ABCDEF	300-1500 L/ha	Spray application with water
3	FUNG	Serenade ASO	14,1	g/L	SC	8 l/ha		ABCDEF	300-1500 L/ha	Spray application
4	FUNG	Ozone			SN	3 ppm pr		ABCDEF	300-1500 L/ha	
	FUNG	Serenade ASO	14,1	g/L	SC	8 l/ha		ABCDEF	300-1500 L/ha	Apply Serenade ASO after Ozone on dry leaves
5	FUNG	Ozone			SN	3 ppm pr		ABCDEF	300-1500 L/ha	Ozone spray application in emulsified sunflower oil with water
	FUNG	Sunflower oil			EC	1% v/v		ABCDEF	300-1500 L/ha	
6	FUNG	Sunflower oil			EC	1% v/v		ABCDEF	300-1500 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?
- What is the efficacy of Sunflower oil alone?
- Are all treatments safe for the crop?

SITE DESCRIPTION

Trial Location

Address (Location): Via Dei Cioffi
City: Eboli **Country:** ITA Italy
State/Prov.: Salerno SA **Region:** Campania
Postal Code: 84091 **Climate Zone:** EPOMED EPPO Mediterranean

Crop Description

Crop 1: C LACSA Lactuca sativa garden lettuce **BBCH Scale:** BVNH
Entry Date: Oct-12-2021 **Stage Scale:** BBCH
Variety: Trocadero
Planting Date: Feb-25-2021
Planting Density: 66666,66 P/ha
Planting Method: TRAHAN transplanted - hand
Rows per Plot: 1
Row Spacing: 50 cm
Spacing within Row: 30 cm

Pest Description

Pest 1 Type: D **Code:** SCLESP Sclerotinia sp. **Entry Date:** Oct-12-2021
Common Name: Sclerotinia sp. **Stage Scale:** BBCH
Artificial Population: N no

Site and Design

Treated Plot Width: 3 m **Total Plot Width:** 3 m **Site Type:** GREENH greenhouse
Treated Plot Length: 5 m **Total Plot Length:** 5 m **Experimental Unit:** 1 PLOT plot
Treated Plot Area: 15,0 m² **Treatments:** 6 **Tillage Type:** CONTIL conventional-till
Replications: 4 **Study Design:** RACOB� Randomized Complete Block (RCB)
Untreated Arrangement: INCLUDED single control randomized in each block

Soil Description

% Sand: 39 **% OM:** 2,1 **Texture:** L loam
% Silt: 41 **pH:** 7,95 **Soil Name:** Laom
% Clay: 20 **Fert. Level:** G good
Soil Drainage: G good

Application Description

	A	B	C	D	E	F
Application Date	Feb-26-2021	Mar-5-2021	Mar-12-2021	Mar-19-2021	Mar-26-2021	Apr-2-2021
Appl. Start Time	11:00	10:00	14:00	11:00	12:00	10:00
Appl. Stop Time	12:00	11:00	15:00	12:00	13:00	11:00
Interval to Prev. Appl.		7 DAYS	7 DAYS	7 DAYS	7 DAYS	7 DAYS
Application Method	BROADC	BROADC	BROADC	BROADC	BROADC	BROADC
Application Timing	PREVEN	FIINSP	FIINSP	FIINSP	FIINSP	FIINSP
Application Placement	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR
Applied By	M.Cagnano	M.Cagnano	M.Cagnano	M.Cagnano	M.Cagnano	M.Cagnano
Appl. Entry Date	Oct-12-2021	Oct-12-2021	Oct-12-2021	Oct-12-2021	Oct-12-2021	Oct-12-2021
Air Temperature Start, Stop	17; 17 C	14; 14 C	20; 19 C	15; 16 C	17; 17 C	16; 16 C
% Relative Humidity Start, Stop	51; 51	58; 58	47; 47	51; 51	59; 59	49; 49
Wind Velocity+Dir. Start	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wind Velocity+Dir. Stop	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wind Velocity+Dir. Max	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wet Leaves (Y/N)	N; no	N; no	N; no	N; no	N; no	N; no
Soil Temperature	16 C	16 C	20 C	14 C	16 C	15 C
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Soil Surface Condition	FINE	FINE	FINE	FINE	FINE	FINE
Weather Source	WSFIELD	WSFIELD	WSFIELD	WSFIELD	WSFIELD	WSFIELD

Comment:

n trt. 3, trt. 4, trt.5 and trt.,6 the standard product was applied by means of knapsack sprayer #273.

Operation pressure: 4 BAR

Nozzle Type: Flat Fan

Nozzle size: 02

Nozzle spacing: 50 cm

Nozzle/Row: 6

Nozzle calibration: 4000 mL/MIN

Time to treat 1 plot:

- Appl. A: 11.26 s
- Appl. B: 11.26 s
- Appl. C: 11.26 s
- Appl. D: 15.76 s
- Appl. E: 15.76 s
- Appl. F: 15.76 s

· **Protocol Application Directions:**

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· **Time and frequency of application**

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· Application A: pre-infection, 1 day after transplant

· Spray interval 5-7 days.

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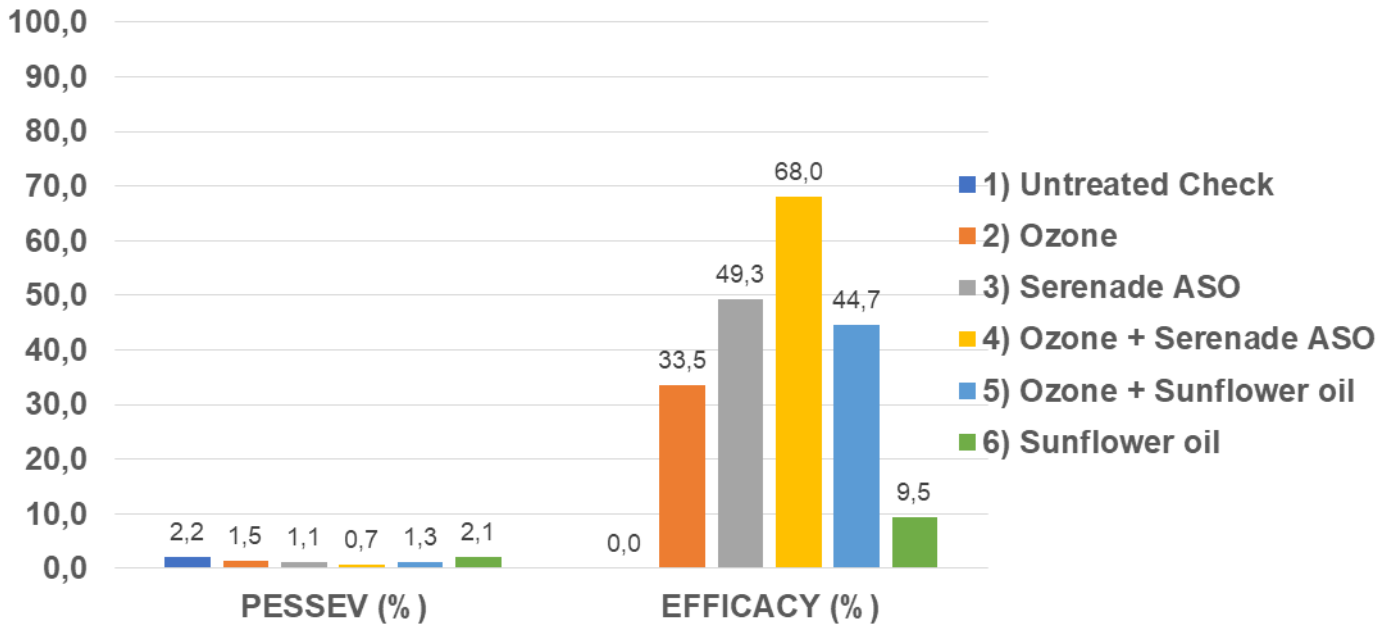
· **Doses and volumes**

· Use water volume variable following crop growth: 300-1500 L/ha

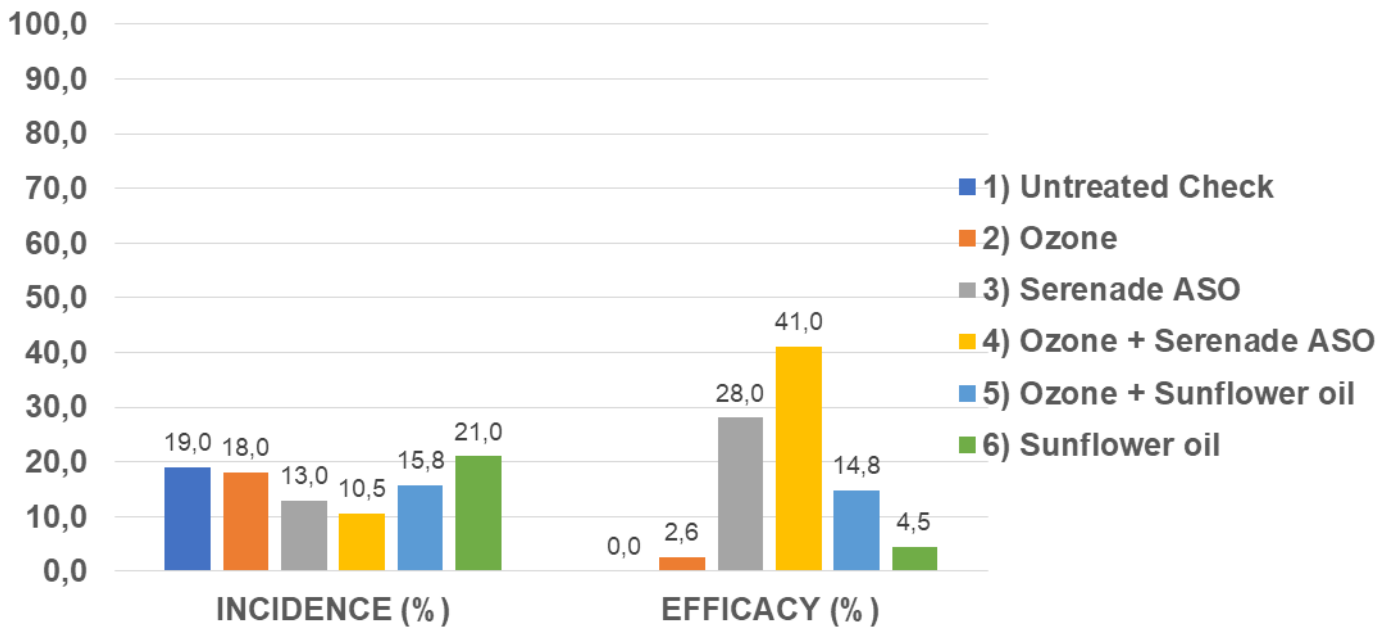
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RESULTS

Incidence on leaves – 14 days after last application



Severity on leaves – 14 days after last application



COMMENTS

English version: At the end of the experimental program for the control of *Sclerotinia sp.* on lettuce, during which 6 applications were carried out based on susceptibility moments of the crop, the untreated check showed a pest incidence on leaf equal to 19.00% and a disease severity equal to 2.21%. Not all the products tested in field showed significant different results if compared to the untreated check regarding the pest severity and pest incidence. The best result on leaves was showed by the strategy of Ozone with the reference product Serenade ASO equal to 40.97% of control, comparable to that of the standard Serenade ASO applied alone with 28.04%. This last was also comparable to the strategy Ozone+Sunflower oil equal to 14.79% as well to Ozone applied alone with 2.63% of pest incidence control. Sunflower oil applied alone, showed a control worse than the untreated. Regarding the disease severity on leaves, excluding Sunflower oil applied alone, the others treatments were comparable among themselves: the strategy of Ozone with the reference product Serenade ASO showed an efficacy equal to 68.04%, the Serenade ASO applied alone 49.28%, the strategy Ozone+Sunflower oil 44.67% and Ozone with 33.53%. The use of Ozone applied alone showed an efficacy comparable to the standard Serenade ASO applied alone. The addition of Ozone to the standard Serenade ASO increase the efficacy of Serenade ASO applied alone but not statistically significant. The strategy of Ozone in emulsified Sunflower oil, do not statistically increase the efficacy of Ozone applied alone.

Versione italiana: Al termine della strategia sperimentale per il controllo di *Sclerotinia sp.* su lattuga, durante la quale sono state realizzate 6 applicazioni basate sui momenti di suscettibilità della coltura, il testimone non trattato ha mostrato una incidenza della malattia su foglia pari al 19.00% e una severità pari al 2.21%. Non tutti i prodotti applicati in campo hanno fornito risultati significativi differenti rispetto al testimone per quanto riguarda la severità e l'incidenza della malattia. Il miglior risultato sulle foglie è stato fornito dalla strategia di Ozono con il prodotto di riferimento Serenade ASO pari al 40.97% di controllo, comparabile a quello dello standard Serenade ASO applicato da solo con 28.04%. Quest'ultimo era anche comparabile con la strategia di Ozono+Sunflower oil pari a 14.79% come pure a Ozono da solo con 2.63% di controllo dell'incidenza. Sunflower oil applicato da solo, ha mostrato un controllo peggiore del non trattato. Riguardo alla severità della malattia sulle foglie, escludendo Sunflower oil applicato da solo, gli altri trattamenti erano comparabili fra loro: la strategia di Ozono con lo standard Serenade ASO ha mostrato una efficacia pari a 68.04%, Serenade ASO applicato da solo 49.28%, la strategia di Ozono+Sunflower oil 44.67% e Ozono con 33.53%. L'uso di Ozono applicato da solo ha mostrato una efficacia comparabile a quella dello standard Serenade ASO applicato da solo. L'aggiunta di Ozono allo standard Serenade ASO aumenta l'efficacia di Serenade ASO ma non in maniera statisticamente significativa. La strategia di Ozono in emulsione con Sunflower oil, non aumenta statisticamente l'efficacia di Ozono applicato da solo.

CONCLUSION

Conclusions:

English version: Within the test aimed at controlling *Sclerotinia sp.* on lettuce, with the use of organic products, Ozone alone showed efficacy in reducing the disease severity on leaves compared to the untreated check but not the disease incidence. Ozone in strategy with the standard Serenade ASO showed the best control in reducing the disease incidence, while Ozone applied alone was comparable to the standard applied alone regarding the pest incidence and pest severity. No symptoms of phytotoxicity were observed.

Versione italiana: All'interno della prova volta al controllo di *Sclerotinia sp.* on lattuce con utilizzo di prodotti biologici, l'Ozono da solo ha mostrato efficacia nel ridurre la severità della malattia sulle foglie rispetto al non trattato ma non l'incidenza della malattia. Ozono in strategia con lo standard Serenade ASO ha mostrato il miglior controllo riducendo l'incidenza della malattia, mentre Ozono applicato da solo era comparabile allo standard applicato da solo riguardo alla incidenza e alla severità della malattia. Non si sono osservati sintomi di fitotossicità.

CONTACTS

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