

A21-019-890FE

Efficacy of ozone applied alone and in mix, against Botrytis sp. and Sclerotinia sp. on baby leaf vegetables. Italy 2021

Trial ID:	A21-019-890FE	Location:	Italy	Trial Year:	2021
Protocol ID:	890A21FE4	Investigator (Creator):	Michele Rugiano		
Project ID:		Study Director:	Antonio Russo		
Official Trial ID:	A21-019-890FE	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	Description	Other Rate	Other Rate Unit	Appl Code	Comment 1	Comment 2
1	CHK	Untreated Check									
2	FUNG	Ozone			SN		3ppm pr		ABCD	300-1500 L/ha	Spray application with water
3	FUNG	Serenade ASO	14,1	g/L	SC		8l/ha		ABCD	300-1500 L/ha	Spray application
4	FUNG	Ozone			SN		3ppm pr		ABCD	300-1500 L/ha	
	FUNG	Serenade ASO	14,1	g/L	SC		8l/ha		ABCD	300-1500 L/ha	Apply Serenade ASO after Ozone on dry leaves
5	FUNG	Ozone			SN		3ppm pr		ABCD	300-1500 L/ha	
	FUNG	Sunflower oil			EC	Rate 1-5 %V/V	1% v/v		ABCD	300-1500 L/ha	Ozone spray application in emulsified sunflower oil with water
6	FUNG	Sunflower oil			EC	Rate 1-5 %V/V	1% v/v		ABCD	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/Soybean oil increase the efficacy of Ozone used 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 ERUVE	Eruca vesicaria ssp. sativa	hedge mustard
Entry Date:	Oct-11-2021		
Variety:	sol.Supra		
Planting Date:	Dec-20-2020		
		Stage Scale:	BBCH
		Planting Density:	1000000 P/ha
		Planting Method:	SEEDED seeded
Row Spacing:	20 cm		
Spacing within Row:	5 cm		

Pest Description			
Pest 1 Type:	D	Code: SCLESP	Sclerotinia sp.
Common Name:			Sclerotinia sp.
		Entry Date:	Oct-11-2021
		Stage Scale:	BBCH
		Artificial Population:	N no

Site and Design			
Treated Plot Width:	1,5 m	Total Plot Width:	1,5 m
Treated Plot Length:	7 m	Total Plot Length:	7 m
Treated Plot Area:	10,5 m ²	Treatments:	6
Replications:	4	Site Type:	GREENH greenhouse
% Slope:	0	Experimental Unit:	1 PLOT plot
Untreated Arrangement:	INCLUDED		single control randomized in each block
Block Arrangement:	BSSPUP		all blocks side by side, plots lying upon each other
		Tillage Type:	CONTIL conventional-till
		Study Design:	RACOB� Randomized Complete Block (RCB)

Soil Description			
% Sand:	37	% OM:	2,4
% Silt:	45	pH:	8,3
% Clay:	18	Texture:	L loam
Soil Drainage:	G good	Soil Name:	Loam
		Fert. Level:	G good

Application Description				
	A	B	C	D
Application Date	Feb-4-2021	Feb-9-2021	Feb-14-2021	Feb-19-2021
Appl. Start Time	10:00	10:00	15:00	14:00
Appl. Stop Time	11:00	11:00	16:00	15:00
Interval to Prev. Appl.		5 DAYS	5 DAYS	5 DAYS
Application Method	BROADC	BROADC	BROADC	BROADC
Application Timing	PREVEN	FIINSP	FIINSP	FIINSP
Application Placement	FOLIAR	FOLIAR	FOLIAR	FOLIAR
Applied By	M.Cagnano	M.Cagnano	M.Cagnano	M.Cagnano
Appl. Entry Date	Oct-11-2021	Oct-11-2021	Oct-11-2021	Oct-11-2021
Air Temperature Start, Stop	15; 15 C	17; 17 C	22; 22 C	18; 19 C
% Relative Humidity Start, Stop	47; 47	52; 52	60; 60	55; 55
Wind Velocity+Dir. Start	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wind Velocity+Dir. Stop	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wind Velocity+Dir. Max	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wet Leaves (Y/N)	N; no	N; no	N; no	N; no
Soil Temperature	16 C	16 C	21 C	20 C
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL
Soil Surface Condition	FINE	FINE	FINE	FINE
Weather Source	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: 7.88 s

· Appl. B: 7.88 s

· Appl. C: 11.03 s

· Appl. D: 11.03 s

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Protocol Application Directions:

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Time and frequency of application

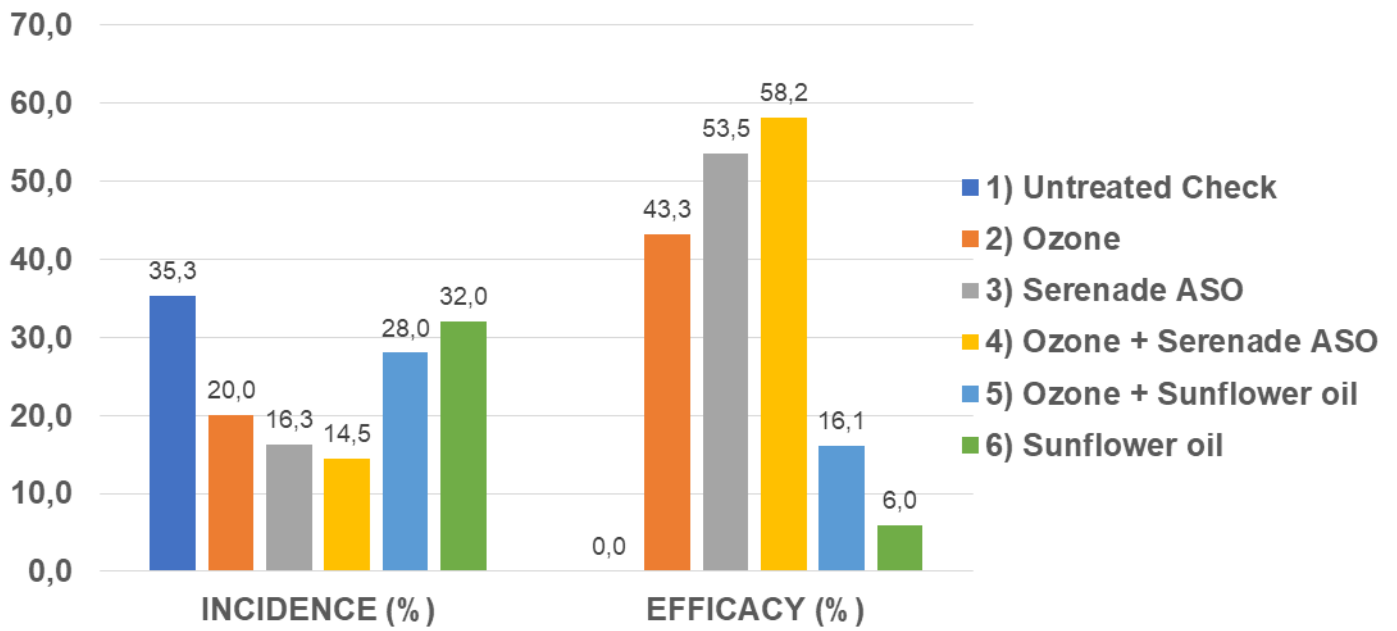
- Application A: pre-infection or at 2-3 leaves
- Spray interval 5 days.

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Doses and volumes

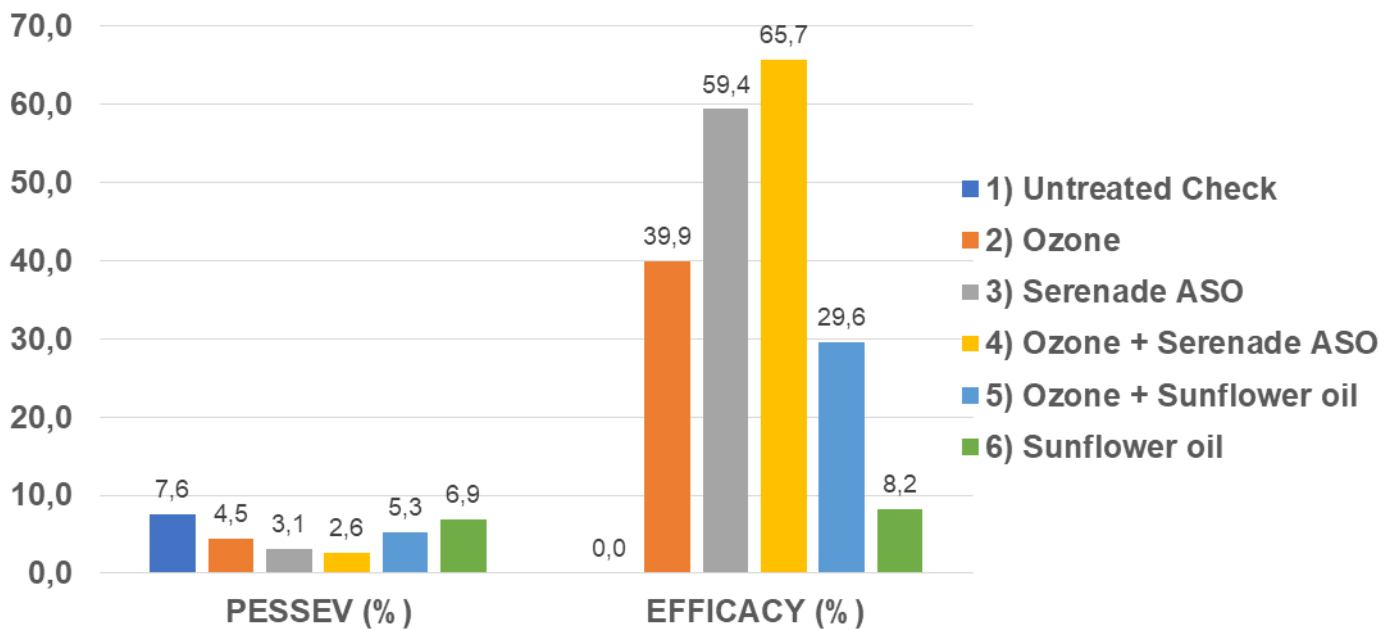
- Use water volume variable following crop growth: 300-1500 L/ha
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RESULTS

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 *eruca sativa*, during which 4 applications were carried out based on susceptibility moments of the crop, the untreated check showed a pest incidence on leaf equal to 35.25% and a disease severity equal to 7.63%. 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 reference product Serenade ASO applied in strategy with Ozone equal to 58.19% of control, comparable to Serenade ASO and to Ozone, both applied alone, with values of 53.50% and 43.26% respectively. Different from the previous ones, the strategy Ozone with Sunflower oil with 16.05% comparable with Sunflower oil alone with 5.96% of pest incidence control. Regarding the disease severity on leaves, the trt. 3 (Serenade ASO, alone) and trt. 4 (Serenade ASO+Ozone) showed comparable results with 59.37% and 65.70% of control. Serenade ASO alone was also comparable to Ozone applied alone that showed 39.86% of disease severity control. The remaining treatments, Ozone+Sunflower oil and Sunflower oil alone were different from the previous ones and among themselves, with values of 29.59% and 8.18% respectively. The use of Ozone applied alone showed an efficacy comparable to the standard Serenade ASO. The addition of Ozone do not increase statistically the efficacy of Serenade ASO applied alone. The addition of Sunflower oil emulsified, do not increase the efficacy of Ozone applied alone.

Versione italiana: Al termine della strategia sperimentale per il controllo di *Sclerotinia sp.* su rucola coltivata, durante la quale sono state realizzate 4 applicazioni, basate sui momenti di suscettibilità della coltura, il testimone non trattato ha mostrato una incidenza della malattia sulle foglie pari al 35.25% con una severità pari al 7.63%. 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 dal prodotto di riferimento Serenade ASO applicato in strategia con Ozono pari al 58.19% di controllo, comparabile con Serenade ASO e Ozono, entrambi applicati da soli, con valori di 53.50% e 43.26% rispettivamente. Differente dai precedenti, la strategia di Ozono con Sunflower oil con 16.05% comparabile con Sunflower oil da solo con 5.96% di controllo dell'incidenza. Riguardo alla severità della malattia sulle foglie, il trt. 3 (Serenade ASO) e trt. 4 (Serenade ASO+Ozono) hanno mostrato risultati comparabili con 59.37% e 65.70%. Serenade ASO da solo era anche comparabile con Ozono applicato da solo che ha mostrato il 39.86% di controllo della severità. I rimanenti trattamenti, Ozono+Sunflower oil e Sunflower oil da solo, erano differenti dai precedenti e fra loro, con valori di 29.59% e 8.18% rispettivamente. L'uso di Ozono applicato da solo ha mostrato una efficacia paragonabile a quella dello standard Serenade ASO. L'aggiunta di Ozono non aumenta statisticamente l'efficacia di Serenade ASO applicato da solo. L'aggiunta di Sunflower oil in emulsione non aumenta l'efficacia di Ozono applicato da solo.

CONCLUSION

Conclusions:

English version: Within the test aimed at controlling *Sclerotinia sp.* on *eruca sativa*, with the use of organic products, Ozone alone showed efficacy in reducing the disease severity and incidence on leaves compared to the untreated check. Ozone in strategy with the standard Serenade ASO showed the best control of the disease nevertheless comparable to the standard applied alone and to Ozone applied alone regarding the pest incidence. No symptoms of phytotoxicity were observed.

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

CONTACTS

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