

A21-015-890FE

Efficacy of ozone applied alone and in mix, against Botrytis spp. on Blackberry. Italy, Spain and Morocco 2021

Trial ID: A21-015-890FE Location: Italy Trial Year: 2021
Protocol ID: 890A21FE7 Investigator (Creator): Michele Rugiano
Project ID: Study Director: Antonio Russo
Official Trial ID: A21-015-890FE Sponsor Contact: Giulio Senese - MET Srl
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	3ppm pr		ABCDE	500-1500 L/ha	Spray application with water
3	FUNG	Serenade ASO	14,1g/L		SC	8l/ha		ABCDE	500-1500 L/ha	Spray application
4	FUNG	Ozone			SN	3ppm pr		ABCDE	500-1500 L/ha	
	FUNG	Serenade ASO	14,1g/L		SC	8l/ha		ABCDE	500-1500 L/ha	Apply Serenade ASO after Ozone on dry leaves
5	FUNG	Ozone			SN	3ppm pr		ABCDE	500-1500 L/ha	Ozone spray application in emulsified
	FUNG	Sunflower oil			EC	1% v/v		ABCDE	500-1500 L/ha	sunflower oil with water
6	FUNG	Sunflower oil			EC	1% v/v		ABCDE	500-1500 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 Tevere		
City:	Scanzano Jonico	Country:	ITA Italy
State/Prov.:	Matera MT	Region:	Basilicata
Postal Code:	75020	Climate Zone:	EPOMED EPPO Mediterranean

Crop Description			
Crop 1:	C RUBID	Rubus idaeus	wild raspberry
Entry Date:	Oct-5-2021		
Variety:	Tulameen		
Planting Date:	Sep-24-2020		
Rows per Plot:	1		
Row Spacing:	1,5 m		
Spacing within Row:	0,4 m		
Stage Scale:	BBCH		
Planting Density:	16500	P/ha	
Planting Method:	TRAHAN	transplanted - hand	
BBCH Scale:	BPBR		
Plant Arrangement: ROW			

Pest Description			
Pest 1 Type:	D	Code: BOTRSP	Botrytis sp.
Common Name:			Botrytis sp.
Entry Date:	Oct-5-2021		
Stage Scale:	BBCH		
Artificial Population: N no			

Site and Design			
Treated Plot Width:	1,3 m	Total Plot Width:	1,3 m
Treated Plot Length:	6 m	Total Plot Length:	6 m
Treated Plot Area:	7,8 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:	43,5	% OM:	1,8
% Silt:	35,2	pH:	8,13
% Clay:	21,3	Texture:	L loam
Soil Drainage:	G good	Soil Name:	Loam
		Fert. Level:	G good

Application Description					
	A	B	C	D	E
Application Date	Feb-8-2021	Feb-15-2021	Feb-22-2021	Mar-1-2021	Mar-8-2021
Appl. Start Time	10:00	9:00	15:00	14:00	11:00
Appl. Stop Time	11:00	10:00	16:00	15:00	12:00
Interval to Prev. Appl.		7 DAYS	7 DAYS	7 DAYS	7 DAYS
Application Method	BROADC	BROADC	BROADC	BROADC	BROADC
Application Timing	ACCRST	FIINSP	FIINSP	FIINSP	FIINSP
Application Placement	FOLIAR	FOLIAR	FOLIAR	FOLIAR	FOLIAR
Applied By	M.cagnano	M.cagnano	M.cagnano	M.cagnano	M.cagnano
Appl. Entry Date	Oct-5-2021	Oct-5-2021	Oct-5-2021	Oct-5-2021	Oct-5-2021
Air Temperature Start, Stop	14; 15 C	10; 10 C	12; 14 C	14; 15 C	15; 15 C
% Relative Humidity Start, Stop	64; 64	68; 68	58; 58	63; 63	61; 61
Wind Velocity+Dir. Start	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wind Velocity+Dir. Stop	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wind Velocity+Dir. Max	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -	0 KPH; -
Wet Leaves (Y/N)	N; no	N; no	N; no	N; no	N; no
Soil Temperature	12 C	12 C	13 C	12 C	10 C
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Soil Surface Condition	FINE	FINE	FINE	FINE	FINE
% Cloud Cover	0	0	0	0	0
Weather Source	WSLOCAL	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 #273.

Operation pressure: 4 BAR

Nozzle Type: Hollow Cone

Nozzle size: 02

Nozzle spacing: 7 cm

Nozzle/Row: 3

Nozzle calibration: 3100 mL/MIN

Time to treat 1 plot:

- Appl. A: 7.55 s
- Appl. B: 7.55 s
- Appl. C: 10.58 s
- Appl. D: 12.1 s
- Appl. E: 12.1 s

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· **Protocol Application Directions:**
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· **Time and frequency of application**
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· A: BBCH 61

· B: BBCH 65

· C: 14 days before harvest

· D: 6 days before harvest

· E: 1 day before harvest

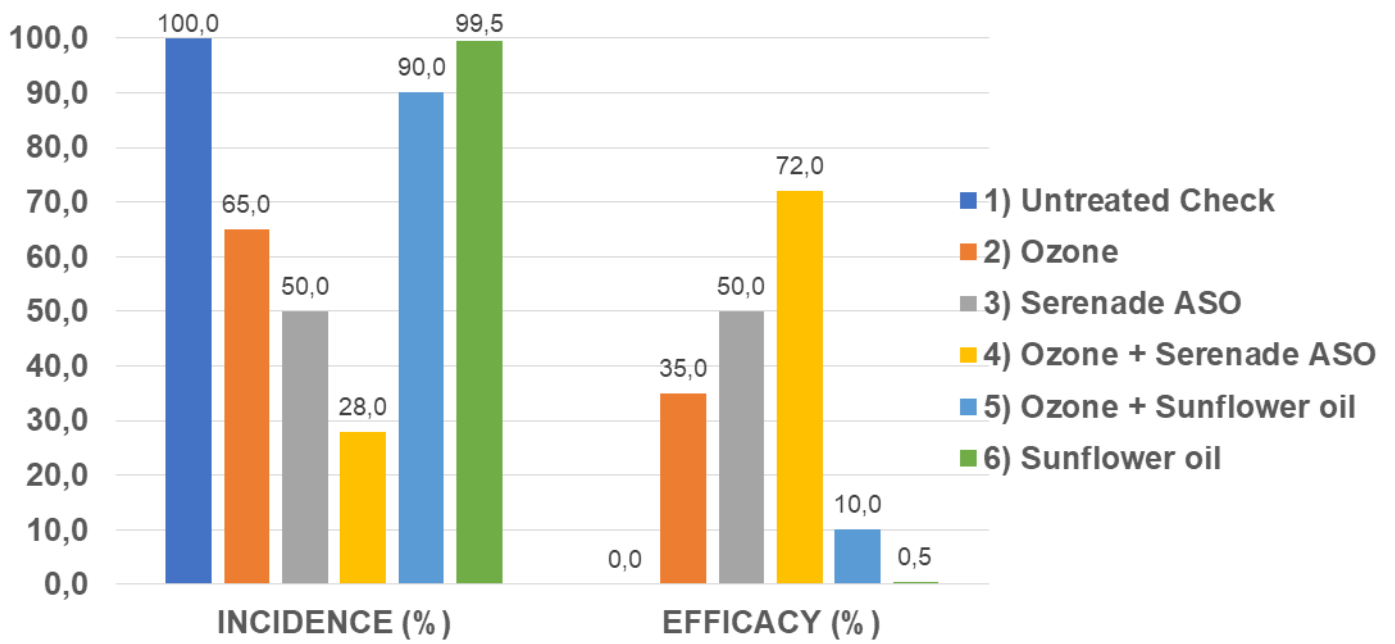
· Minimum spray interval: 5 days.
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· **Doses and volumes**

· Use water volume variable following crop growth: 500-1500 L/ha
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RESULTS

Incidence on fruits – 10 days after last application



COMMENTS

English version: At the end of the experimental program for the control of *Botrytis sp.* on raspberry, during which 5 applications were carried out based on susceptibility moments of the crop, the untreated check showed a pest incidence on fruits equal to 100.0%, comparable to that showed by Sunflower oil applied alone with 99.5% and with the strategy based on Ozone + Sunflower oil with 90.0% of incidence. The best result on fruits, was showed by the strategy of reference product Serenade ASO + Ozone with only 28.0% of pest incidence corresponding to 72.0% of control, different from all the others treatments. The standard Serenade ASO applied alone showed 50.0% of efficacy and Ozone alone 35%. Ozone applied alone was different from the standard applied alone. The addition of Ozone to the standard Serenade ASO, increase the efficacy of Serenade ASO applied alone. The addition of Sunflower emulsified oil do not increase the efficacy of Ozone applied alone.

Versione italiana: Al termine della strategia sperimentale per il controllo di *Botrytis sp.* su lampone, durante la quale sono state realizzate 5 applicazioni, basate sui momenti di suscettibilità della coltura, il testimone non trattato ha mostrato una incidenza della malattia sui frutti pari al 100.0%, comparabile a quella mostrata Sunflower oil applicato da solo con 99.5% e con la strategia basata su Ozono + Sunflower oil con il 90.0% di incidenza. Il miglior risultato sui frutti è stato mostrato dalla strategia del prodotto di riferimento Serenade ASO + Ozono con solo il 28% di incidenza corrispondente al 72% di controllo, differente da tutti gli altri trattamenti. Lo standard Serenade ASO applicato da solo ha mostrato il 50% di efficacia e l'Ozono da solo il 35%. Ozono applicato da solo era differente dallo standard applicato da solo. L'aggiunta di Ozono allo standard Serenade ASO aumenta l'efficacia di Serenade ASO applicato da solo. Il Sunflower oil in emulsione non aumenta l'efficacia di Ozono applicato da solo.

CONCLUSION

Conclusions:

English version: Within the test aimed at controlling *Botrytis sp.* on raspberry, with the use of organic products, Ozone alone showed efficacy in reducing the disease incidence on fruits compared to the untreated check. Ozone in strategy with the standard Serenade ASO showed the best control of the disease differentiating from all the others treatments. No symptoms of phytotoxicity were observed.

Versione italiana: All'interno della prova volta al controllo di *Botrytis sp.* su lampone con utilizzo di prodotti biologici, l'Ozono da solo ha mostrato efficacia nel ridurre l'incidenza della malattia sui frutti rispetto al non trattato. Ozono in strategia con lo standard Serenade ASO ha mostrato il miglior controllo della malattia differenziandosi da tutti gli altri trattamenti. Non si sono osservati sintomi di fitotossicità.

CONTACTS

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