

AES21-008-890FE

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

Trial ID:AES21-008-890FE Location:Spain Trial Year:2021
Protocol ID:890A21FE7 Investigator (Creator):Daniel Tamarit Latorre
Project ID: Study Director:Francesco Valli - Agri 2000
Official Trial ID:890A21FE7 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	Registration Number	Other Rate	Other Unit	Appl Code	Comment 2
1	CHK	Untreated Check								
2	FUNG	Ozone			SN		3ppm pr		ABCDE	Spray application with water
3	FUNG	Serenade ASO	14,1	g/L	SC	ES-00154	8l/ha		ABCDE	Spray application
4	FUNG	Ozone			SN		3ppm pr		ABCDE	
	FUNG	Serenade ASO	14,1	g/L	SC	ES-00154	8l/ha		ABCDE	Apply Serenade ASO after Ozone on dry leaves
5	FUNG	Ozone			SN		3ppm pr		ABCDE	Ozone spray application in emulsified sunflower oil with water
	FUNG	Sunflower oil			EC		1% v/v		ABCDE	
6	FUNG	Sunflower oil			EC		1% v/v		ABCDE	Spray application

OBJECTIVES

Objectives:

- Do the Ozone used alone have efficacy comparable to the standard Serenade ASO Sector?
- 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.Valencia
Postal Code:46133 Climate Zone:EPOMED EPPO Mediterranean

Crop Description

Crop 1:C FRAAN Fragaria x ananassa strawberry BBCH Scale:BSTB
Entry Date:23-4-21 Crop Group:13-07G Stage Scale:BBCH
Variety:San Andreas
Planting Date:8-2-21 Natural Crop Population:N
Planting Rate:50 P/PLOT
Planting Density:100000 P/ha
Planting Method:TRANSP transplanted
Planting Equipment:HA by hand
Seed Bed:MEDIUM medium
Soil Moisture:GOOD good
Rows per Plot:2
Row Spacing:1 m
Spacing within Row:0,2 m
Harvest Date:1-5-21

Pest Description

Pest 1 Type:D Code:BOTRSP Botrytis sp. Entry Date:9-8-21
Common Name:Botrytis sp. Stage Scale:BBCH
Artificial Population:N no
Crop:1 FRAAN

Site and Design

Treated Plot Width:1 m Total Plot Width:1 m Site Type:GREENH greenhouse
Treated Plot Length:5 m Total Plot Length:5 m Experimental Unit:1 PLOT plot
Treated Plot Area:5,0 m2 Treatments:6 Tillage Type:CONCIL conventional-till
Replications:4 Study Design:RACOB Randomized Complete Block (RCB)
% Slope:0 Plots arranged as in field?:Y Exposure:Southeast
Untreated Arrangement:INCLUDED single control randomized in each block
Block Arrangement:BUPSS all blocks lying upon each other, plots side by side
Distance between Blocks:0 m

Soil Description

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

Application Description

	A	B	C	D	E
Application Date	Mar-9-2021	Mar-15-2021	Apr-16-2021	Apr-23-2021	Apr-30-2021
Appl. Start Time	13:30	11:00	8:00	11:30	8:00
Appl. Stop Time	14:30	12:00	9:30	12:15	9:30
Interval to Prev. Appl.		6 DAYS	32 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	D.Tamarit	D.Tamarit	Daniel Tamarit	D.Gijón	Daniel Tamarit
Appl. Entry Date	Apr-23-2021	Apr-23-2021	Sep-29-2021	Sep-29-2021	Sep-29-2021
Air Temperature Start, Stop	15,9; - C	16,5; - C	19,7; - C	21,3; - C	16,8; - C
% Relative Humidity Start, Stop	78,9; -	65,7; -	63,5; -	59,3; -	66,5; -
Wind Velocity+Dir. Start	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -	0 MPS; -
Wet Leaves (Y/N)	N; no	N; no	N; no	N; no	N; no
Soil Temperature	9,6 C	10,2 C	14,6 C	14,5 C	10,7 C
Soil Moisture	GOOD	GOOD	GOOD	GOOD	GOOD
Soil Surface Condition	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
Next Moisture Occurred On	Mar-18-2021	Mar-18-2021	Apr-7-2021	Apr-7-2021	Apr-15-2021
Time to Next Moisture	9,0 DAY	3,0 DAY	8,0 DAY	2,0 DAY	3,0 DAY
Moisture 6 Hours after Appl.	0 mm	0 mm	0 mm	0 mm	0 mm
Moisture 1 Week after Appl.	0 mm	28,7 mm	0 mm	8,5 mm	5,5 mm
Weather Source	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL	WSLOCAL

Comment:

Time to treat 1 plot:

- Appl. A: 10.94 s
- Appl. B: 10.94 s
- Appl. C: 16.42 s
- Appl. D: 16.42 s
- Appl. E: 16.42 s

Protocol Application Directions:

Time and frequency of application

A: BBCH 61

B: BBCH 65

C: 15 days before harvest

D: 6 days before harvest

E: 8 day before harvest

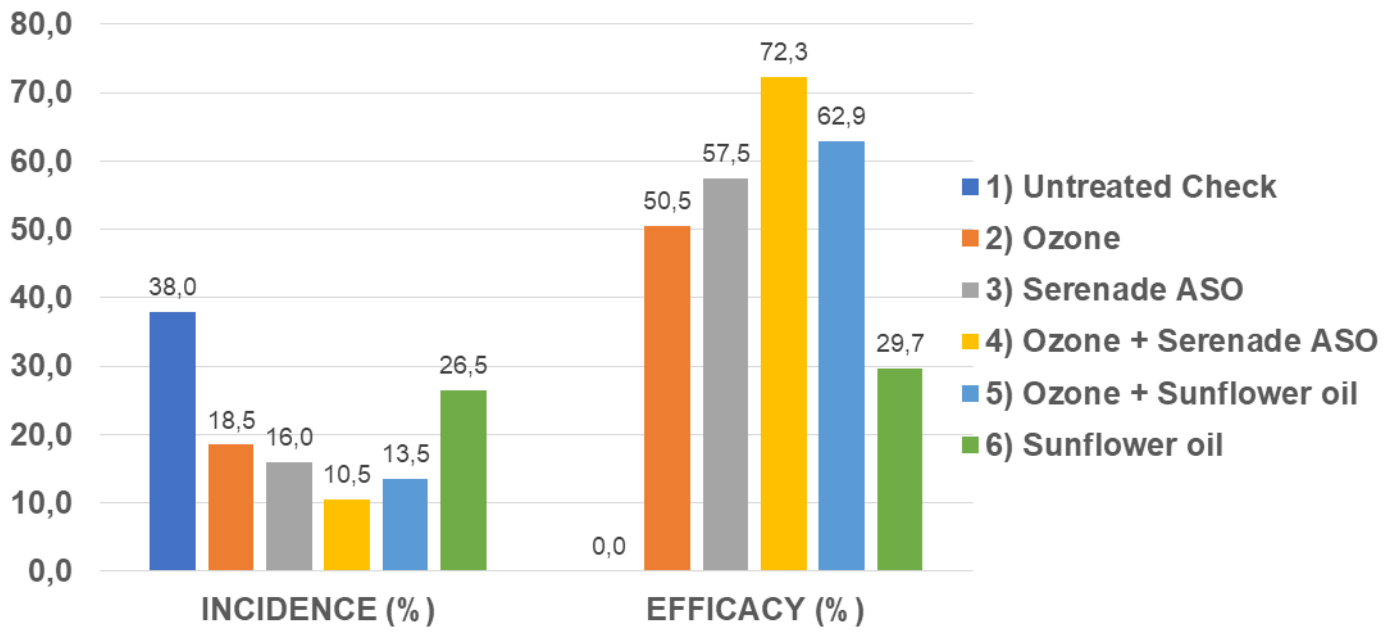
Minimum spray interval: 5 days.

Doses and volumes

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

RESULTS

On fruits – after 3 days storage



COMMENTS

English version: At the end of the experimental program for the control of *Botrytis* on strawberry, during which 5 applications were carried out based on susceptibility moments of the crop, the untreated check provided an incidence of fruits equal to 38.0% (19.0 attacked fruits on 50 fruits) with a consequent serious 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 *Botrytis* damage to 10.5% of fruits, ensuring a more qualitative production to the crop. Comparable statistical data were presented by the combination of Ozone plus Sunflower oil and standard Serenade ASO applied alone showed a pest incidence equal to 13.5% and 16.0% respectively. Intermediate result was observed in Ozone applied alone with 18.5% followed by treatment with Sunflower oil, which showed 26.5% of pest incidence.

Versione italiana: Alla fine del programma sperimentale per il controllo di *Botrytis* su fragola, durante il quale sono state eseguiti 5 applicazioni basate sui periodi di suscettibilità della coltura, il testimone non trattato ha mostrato un'incidenza sui frutti uguale al 38.0% (19.0 frutti attaccati in 50 frutti), con un conseguente serio danno alla resa. Tutti i prodotti testati hanno mostrato risultati significativi rispetto al 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 *Botrytis* al 10.5% su frutto, assicurando una produzione maggiormente qualitativa alla coltura. Dati statistici comparabili sono stati presentati dalla combinazione di ozono più olio di girasole e lo standard Serenade ASO applicati da solo che hanno mostrato una pest incidence rispettivamente al 13,5% e al 16,0%. Risultato intermedio è stato osservato nell'ozono applicato da solo con il 18,5% seguito dal trattamento con olio di girasole, che ha mostrato 26,5% di incidenza.

CONCLUSIONS

English version: Within the test aimed at controlling *Botrytis* sp. on strawberry with the use of organic products, Ozone alone showed efficacy on fruits. Ozone in strategy with Serenade ASO contributes to an improvement of the efficacy of the latter and the use of ozonated sunflower oil showed a higher disease control than ozonated water. 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 *Botrytis* sp. su fragola con uso di prodotti organici, l'ozono da solo ha mostrato efficacia su frutto. L'ozono in strategia con lo standard Serenade ASO contribuisce a migliorare l'efficacia di quest'ultimo e l'uso di olio di girasole ozonato ha mostrato un maggior controllo rispetto all'acqua ozonata. Non sono stati osservati sintomi di fitotossicità. L'olio di girasole applicato da solo ha mostrato meno efficacia rispetto al resto dei trattamenti.

CONTACTS

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