

A21-017-890FE

Efficacy of ozone applied alone and in mix, against Peronospora belbahrii on Basil. Italy 2021

Trial ID: A21-017-890FE Location: Italy Trial Year: 2021
Protocol ID: 890A21FE6 Investigator (Creator): Michele Rugiano
Project ID: Study Director: Antonio Russo
Official Trial ID: A21-017-890FE Sponsor Contact: Giulio Senese - MET Srl
Trial Origin: C contracted trial

TREATMENT LIST

Trt No.	Type	Treatment Name	Form Conc	Form Unit	Form Type	Description	Other Rate	Other Rate Unit	Appl Code	Comment 1	Comment 2
1	CHK	Untreated Check									
2	FUNG	Ozone			SN		3ppm pr		ABCDEF	500-1000 L/ha	Spray application with water
3	FUNG	Airone Liquido	272	g/L	SC		2,7	/ha	ABCDEF	500-1000 L/ha	Spray application
4	FUNG	Ozone			SN		3ppm pr		ABCDEF	500-1000 L/ha	
	FUNG	Airone Liquido	272	g/L	SC		2,7	/ha	ABCDEF	500-1000 L/ha	Apply Airone Liquido after Ozone on dry leaves
5	FUNG	Ozone			SN		3ppm pr		ABCDEF	500-1000 L/ha	Ozone spray application in emulsified
	FUNG	Sunflower oil			EC	Rate 1-5 %V/V	1%	v/v	ABCDEF	500-1000 L/ha	sunflower oil with water
6	FUNG	Sunflower oil			EC	Rate 1-5 %V/V	1%	v/v	ABCDEF	500-1000 L/ha	Spray application

OBJECTIVES

Objectives:

- Do the Ozone used alone have efficacy comparable to the standard Airone Liquido?
- Does the addition of Ozone to the standard Airone Liquido increase the efficacy of Airone Liquido 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):	S.S. 544 FG- Trinitapoli, 34
City:	CERIGNOLA Country: ITA Italy
State/Prov.:	Foggia FG Region: Puglia
Postal Code:	71042 Climate Zone: EPOMED EPO Mediterranean

Crop Description	
Crop 1:	C OCIBA Ocimum basilicum sweet basil BBCH Scale: BDIC
Entry Date:	Oct-7-2021 Stage Scale: BBCH
Variety:	Basilico genovese
Planting Date:	Apr-28-2021 Planting Density: 166667 P/ha
	Planting Method: TRAHAN transplanted - hand
Row Spacing:	30 cm
Spacing within Row:	20 cm

Pest Description	
Pest 1 Type: D Code: PEROBE Peronospora belbahrii Entry Date: Oct-7-2021	
Common Name:	downy mildew of basil Stage Scale: BBCH
	Artificial Population: N no

Site and Design		
Treated Plot Width: 3 m	Total Plot Width: 3 m	Site Type: FIELD field
Treated Plot Length: 5 m	Total Plot Length: 5 m	Experimental Unit: 1 PLOT plot
Treated Plot Area: 15,0 m ²	Treatments: 6	Tillage Type: CONTIL conventional-till
Replications: 4		Study Design: RACOBL Randomized Complete Block (RCB)
% Slope: 0		
Untreated Arrangement: INCLUDED	single control randomized in each block	
Block Arrangement: BSSPUP	all blocks side by side, plots lying upon each other	

Soil Description		
% Sand: 41	% OM: 2,3	Texture: L loam
% Silt: 41	pH: 7,9	Soil Name: Loam
% Clay: 18		Fert. Level: G good
Soil Drainage: G good		

Application Description						
	A	B	C	D	E	F
Application Date	May-14-2021	May-21-2021	May-28-2021	Jun-4-2021	Jun-11-2021	Jun-18-2021
Appl. Start Time	9:00	8:00	16:00	8:00	17:00	17:00
Appl. Stop Time	10:00	9:00	17:00	9:00	18:00	18:00
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-7-2021	Oct-7-2021	Oct-7-2021	Oct-7-2021	Oct-7-2021	Oct-7-2021
Air Temperature Start, Stop	15; 16 C	13; 15 C	24; 24 C	19; 21 C	27; 27 C	21; 21 C
% Relative Humidity Start, Stop	41; 41	38; 38	53; 53	47; 47	51; 49	38; 38
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	12 C	16 F	19 C	15 C	20 C	20 C
Soil Moisture	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
Soil Surface Condition	FINE	FINE	FINE	FINE	FINE	FINE
% Cloud Cover	0	20	0	0	10	0
Next Moisture Occurred On	May-15-2021	May-30-2021	May-30-2021	Jun-7-2021	Jun-12-2021	Jul-17-2021
Time to Next Moisture	1,0 DAY	9,0 DAY	2,0 DAY	3,0 DAY	1,0 DAY	19,0 DAY
Moisture 6 Hours after Appl.	0 mm	0 mm	0 mm	0 mm	0 mm	0 mm
Moisture 1 Week after Appl.	5,4 mm	1,8 mm	1,8 mm	0,8 mm	3,6 mm	0 mm
Weather Source	WSLOCAL	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: 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: 15.76 s
- Appl. D: 18.0 s
- Appl. E: 18.0 s

· **Protocol Application Directions:**

· **Time and frequency of application**

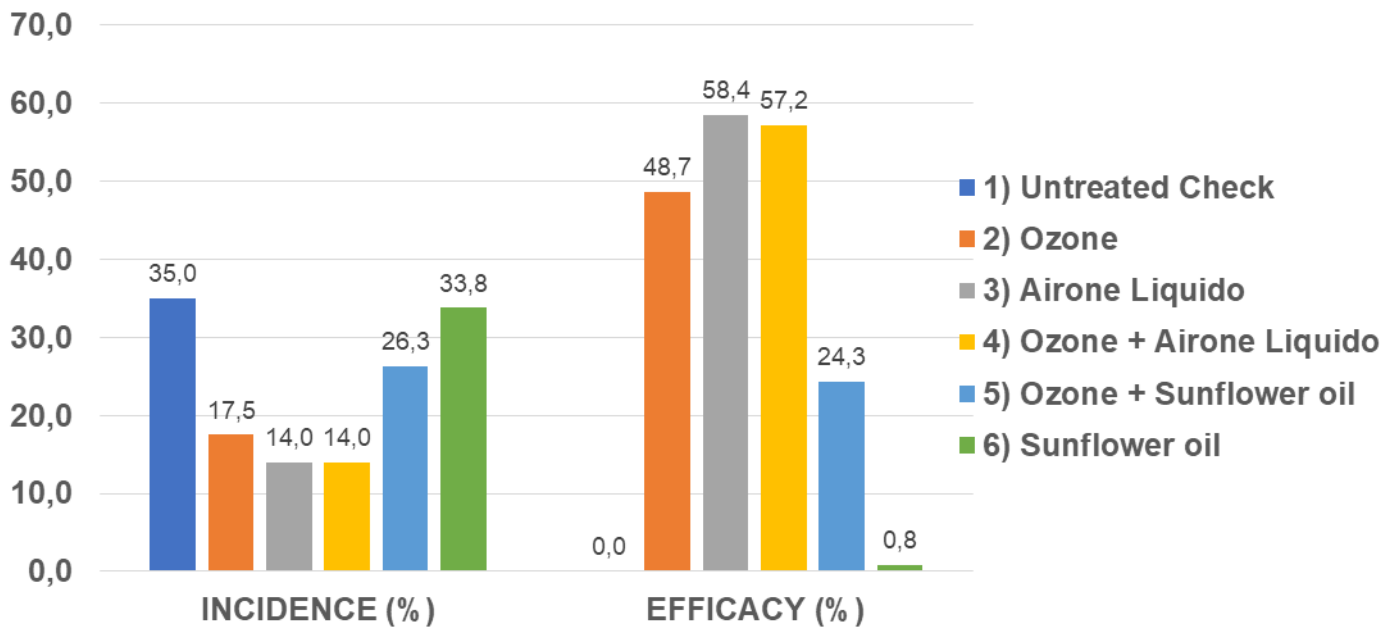
- Application A: pre-infection
- Spray interval 7 days.

· **Doses and volumes**

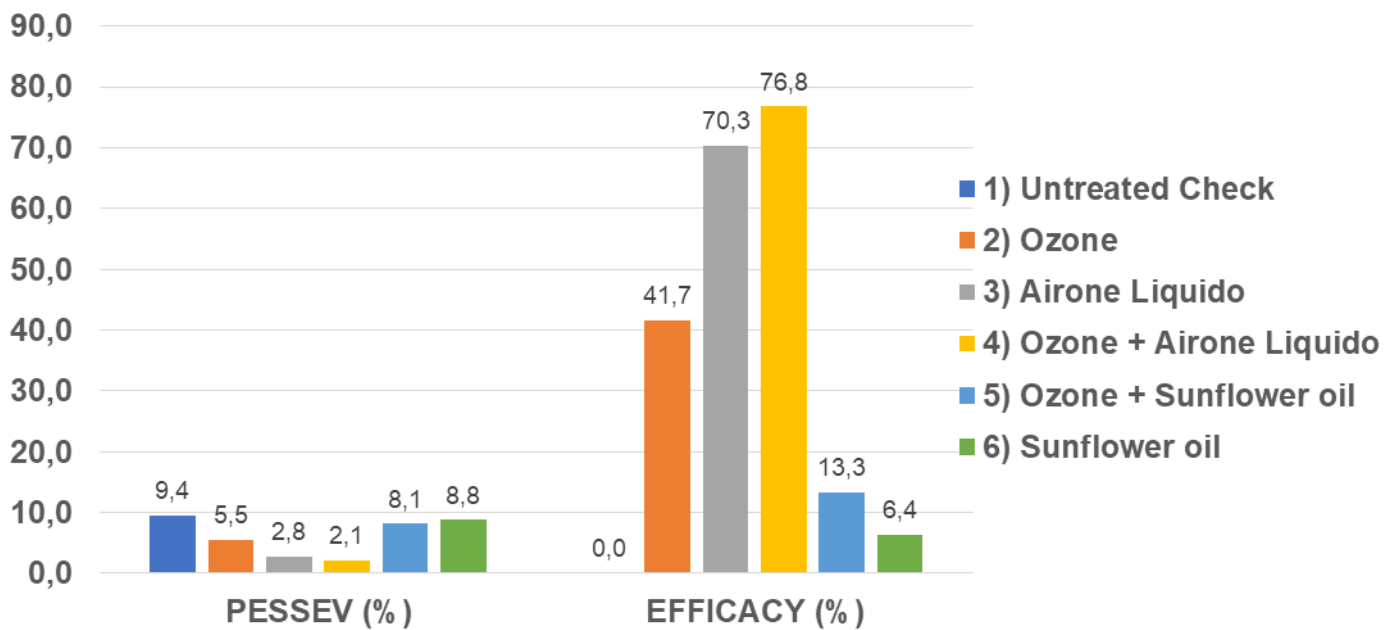
- Use water volume variable following crop growth: 500-1000 L/ha

RESULTS

Incidence on leaves – 10 days after last application



Severity on leaves – 10 days after last application



COMMENTS

English version: At the end of the experimental program for the control of *Peronospora belbahrii* on basil, 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 35.00% and a disease severity equal to 9.43%. 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 Airone Liquido applied alone and applied in strategy with Ozone, comparable among themselves respectively with 58.44% and 57.18% of pest incidence control. Furthermore, the previous treatments were comparable with Ozone applied alone with 48.66% of control. Lower value was observed in Ozone with Sunflower oil emulsified with 24.32% (comparable with Ozone alone) and of Sunflower oil alone with 0.80% of pest incidence control. Regarding the disease severity on leaves, the trt. 3 and trt. 4 showed comparable results with 70.29% and 76.77% of control, followed by trt. 2 with 41.65% differentiating from the remaining treatments. Ozone applied alone was comparable to the standard applied alone regarding the pest incidence but was different regarding the pest severity. The addition of Ozone do not increase the efficacy of Airone Liquido 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 *Peronospora belbahrii* su basilico, 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 sulle foglie pari al 35.00% con una severità pari al 9.43%. 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 Airone Liquido applicato da solo e applicato in strategia con Ozono, comparabili fra loro rispettivamente con il 58.44% e 57.18% di controllo dell'incidenza. Inoltre, i trattamenti precedenti erano comparabili con Ozono applicato da solo con il 48,66% di controllo. Il valore più basso è stato osservato nell'Ozono con olio di Girasole emulsionato con il 24,32% (paragonabile al solo Ozono) e del solo Olio di Girasole con lo 0,80% di controllo sull'incidenza. Riguardo alla severità della malattia sulle foglie, il trt. 3 e trt. 4 hanno mostrato risultati comparabili con 70.29% e 76.77% di controllo, seguiti dal trt. 2 differenziandosi dai rimanenti trattamenti. Ozono applicato da solo era comparabile con lo standard applicato da solo riguardo alla incidenza della malattia ma era differente riguardo alla severità. L'aggiunta di Ozono non aumenta l'efficacia di Airone Liquido 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 *Peronospora belbahrii* on basil, 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 Airone Liquido showed the best control of the disease nevertheless comparable to the standard applied alone. No symptoms of phytotoxicity were observed.

Versione italiana: All'interno della prova volta al controllo di *Peronospora belbahrii* su basilico 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 Airone Liquido ha mostrato il miglior controllo della malattia tuttavia comparabile allo standard applicato da solo. Non si sono osservati sintomi di fitotossicità.

CONTACTS

Renzo Bucchi

Scientific Responsible

Agri 2000 Net Srl

www.agri2000net.com

bucchi@agri2000.it