

# DIACHEM®

**BORTAN, il nuovo biostimolante  
completamente vegetale di Diagro.  
Nuove evidenze su IV gamma”**

**LUIGI ZAMPELLA**  
Field Marketing Specialist Centre-South West

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**BIOSTIMOLANTI  
CONFERENCE**



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# DIACHEM®

chimiberg®

Fungicidi  
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Acaricidi  
Erbicidi  
Fitoregolatori  
Vari

DIAGRO®

Fertirriganti  
Biostimolanti  
e fertilizzanti speciali  
Acceleratori di fotosintesi  
Fertilizzanti integrati  
Prodotti speciali

**Chimiberg and Diagro:**

*“perché proteggere e nutrire sono due facce della stessa medaglia”*



**PROTEGGERE E NUTRIRE  
SONO DUE FACCE  
DELLA STESSA MEDAGLIA**

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FERTIRRIGANTI

160	Five Fructus 18-9-36 + 6 CaO + 3 MgO	163	GL Calciphos 9-64-0 + 11 CaO
161	Five Multi 20-20-20 + 6 CaO + 3 MgO	164	GL P-K-S 
162	Five Terra 12-44-12 + 6 CaO + 3 MgO	165	GL Starter 16-69-16

BIOSTIMOLANTI E FERTILIZZANTI SPECIALI

168	Actifluid® B	180	Fertigizer® 55+2E
170	Aminocur®	181	Fertistar ZM+3E
172	Aminomix®	182	Gheox Zn
173	Aminomix® pH Acid	184	Nutrigizer® 60+2E
174	Aminomix® Vegetal	185	Seaweed
175	Aminozime® Ultra	186	Seaweed Eklonia
176	Bortan	187	Sequelane® Fe 64.8
178	Enerleaf®	188	Sinergizer® 15

ACCELERATORI DI FOTOSINTESI

193	Pentac-5 Ala® 	195	Pentac Rice 
194	Pentacalcium® 		

FERTILIZZANTI INTEGRATI E INDUTTORI DI RESISTENZA

198	AZN 	201	Furos® Twin: F1 - Nem2
199	Bio-D	202	Iron 4
200	Dentamet®	203	Zip®

PRODOTTI SPECIALI

206	Cober® Plus	211	Performer® Lveg EVO
207	Delumbri Limax	212	Performer® Mveg
208	Herfosec	213	Soptech
209	OMNiclear Plus	214	Virens pH
210	Performer® Lveg		

**RICCO DI  
ESTRATTI UMICI  
E TANNINI**

**Bortan**



**CONCIME  
ORGANICO  
AZOTATO**

 **DIAGRO**

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**NOVITÀ**

# BIOSTIMOLANTI E FERTILIZZANTI SPECIALI

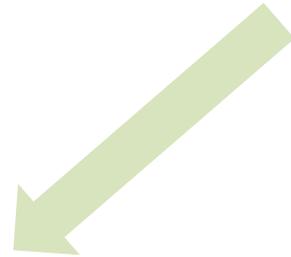


- Concime organico azotato
- **Borlanda fluida** attivata con il 10% di estratti umici da ammendante vegetale semplice non compostato, naturalmente ricco in **tannini**
- Prontamente assimilabile per via radicale,
- La presenza di **polifenoli** permette di migliorare la struttura del suolo, ridurre i danni dovuti a eccessi di salinità, nonché favorire lo sviluppo della microflora utile (antagonisti microbici)
- Le proprietà complessanti del formulato promuovono la crescita dell'apparato radicale e l'assimilazione degli elementi nutritivi utili per le piante, generando anticipi ed aumento della resa per ettaro

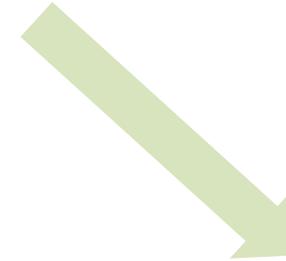
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## LA SPERIMENTAZIONE

**IV GAMMA**



**LATTUGHINO**  
(verde – rosso)



**RUCOLA**

# LATTUGHINO – BORTAN

CROP: **Green Batavia – Red Batavia**

Variety: Falstaff - Copacabana

CRO: Sele Agresearch – CREA-OFA

Location: Pontecagnano (SA)

Target: *Parametri morfometrici/Qualità/Stress ossidativo*



## TREATMENTS TABLE

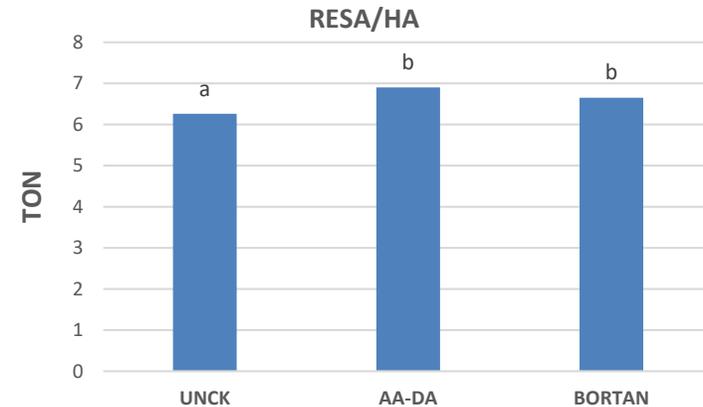
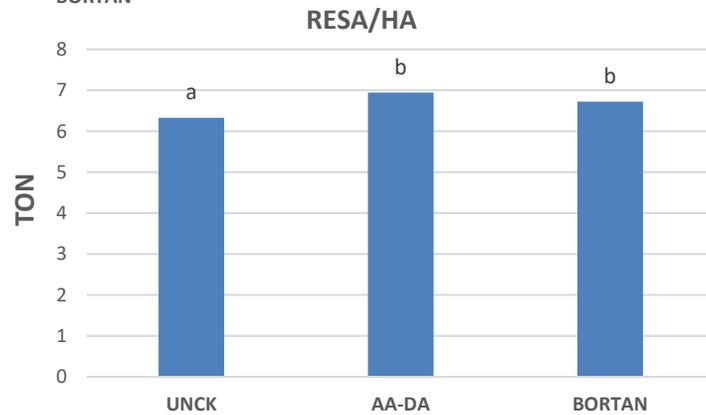
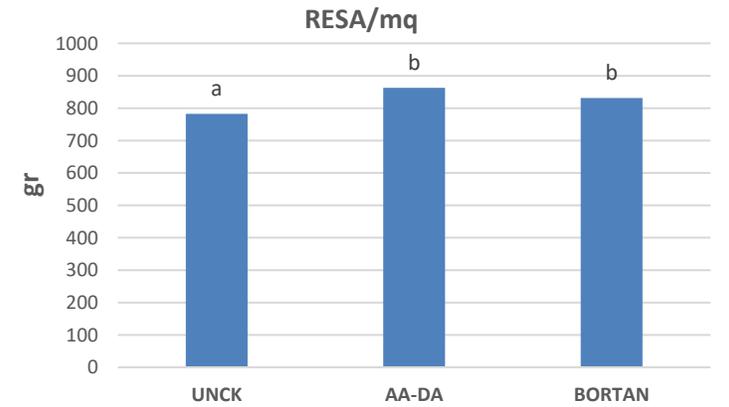
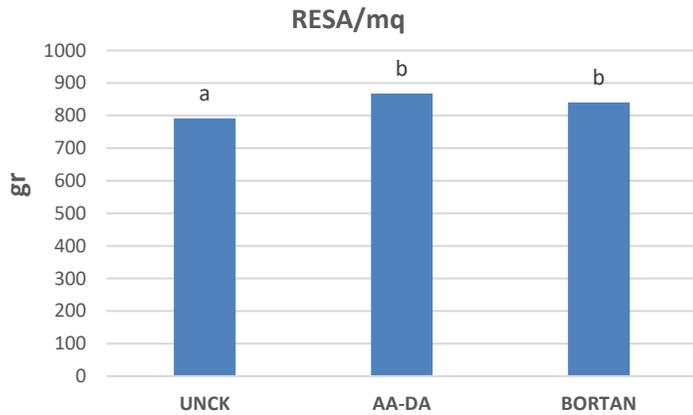
Treatments	Dose rate	Application code
UNTREATED CHECK	-	-
AADA	10 l/ha	A (20 gg post-seminal)
BORTAN	10 l/ha	A (20 gg post-seminal)

# RESULTS

## Dati Agronomici



$\Delta$ PLV ~ 1.000,00 €/ha

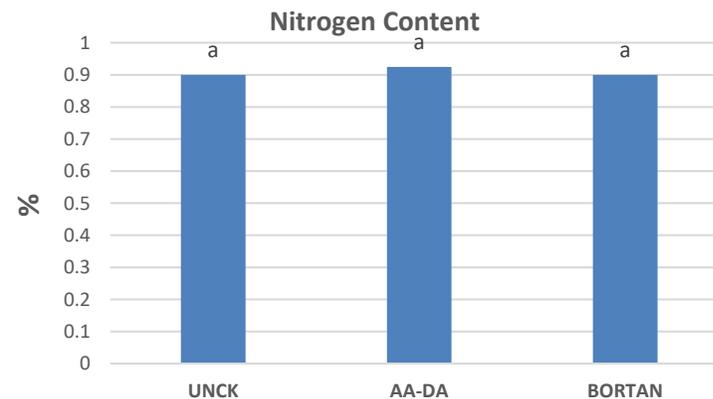
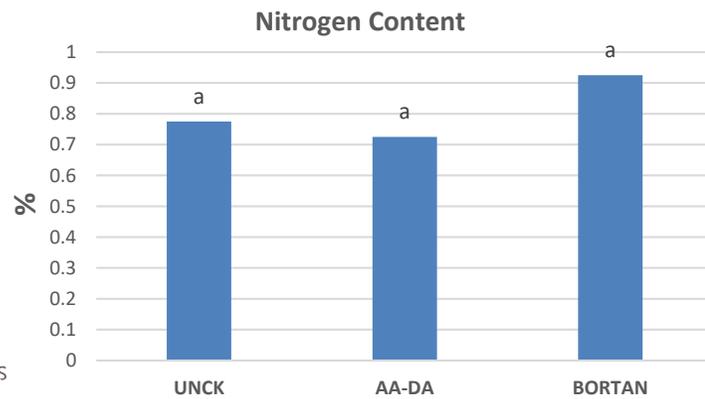
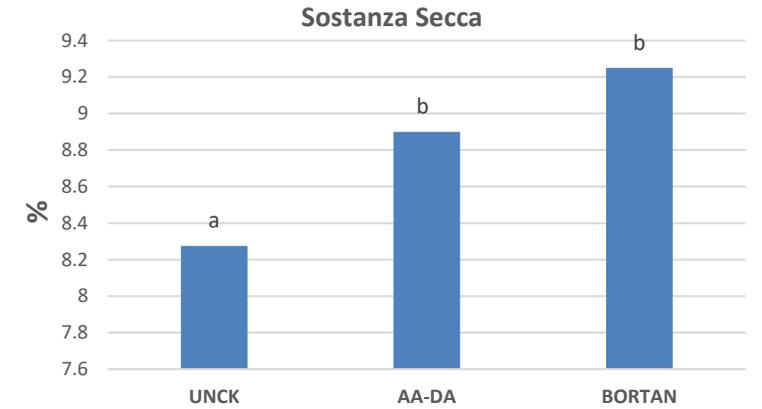
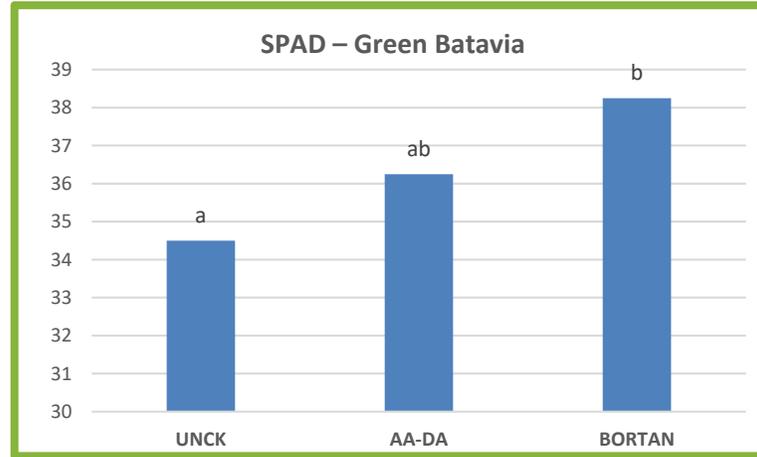
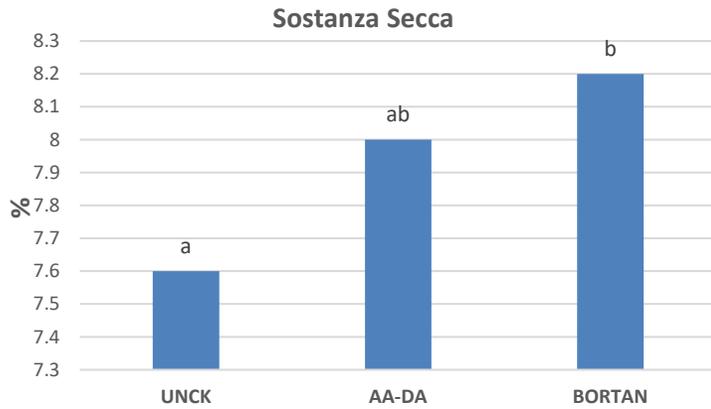


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# RESULTS

## Dati Agronomici

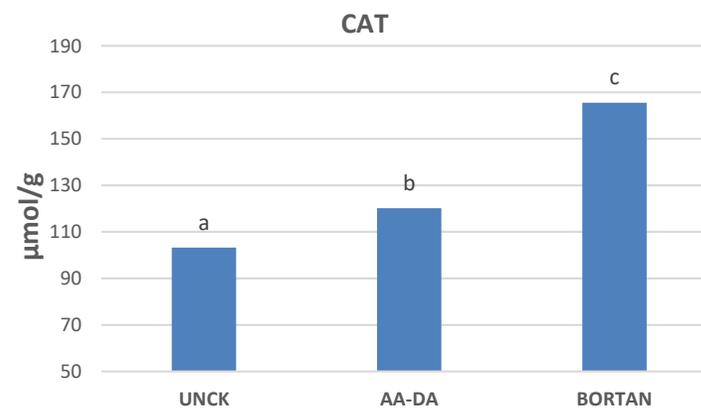
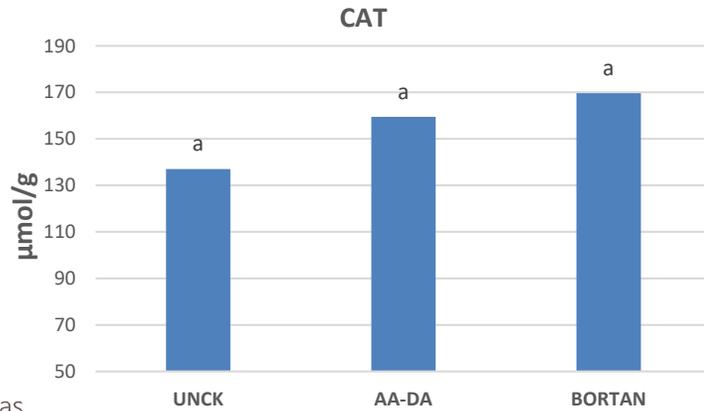
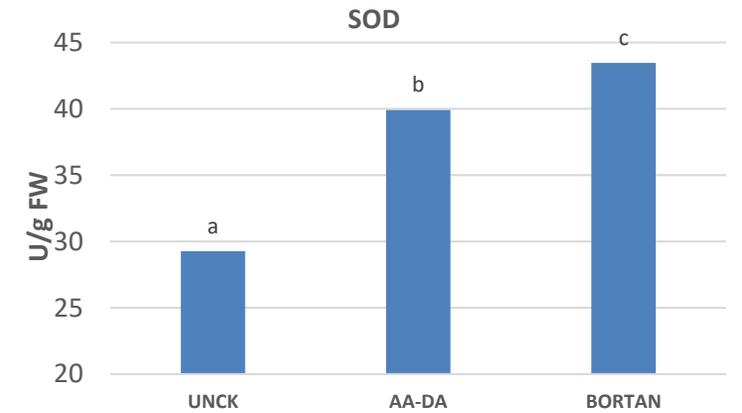
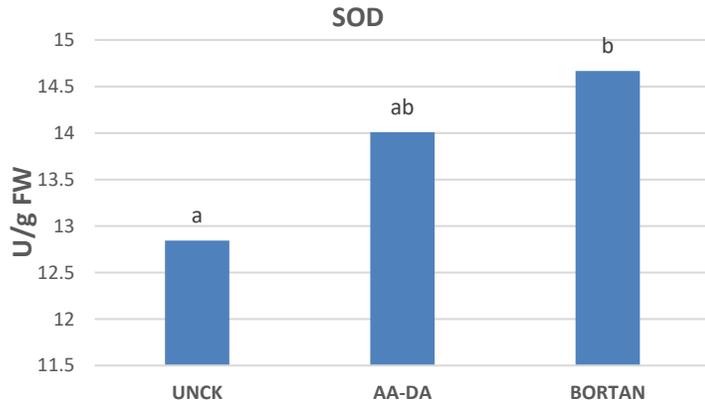
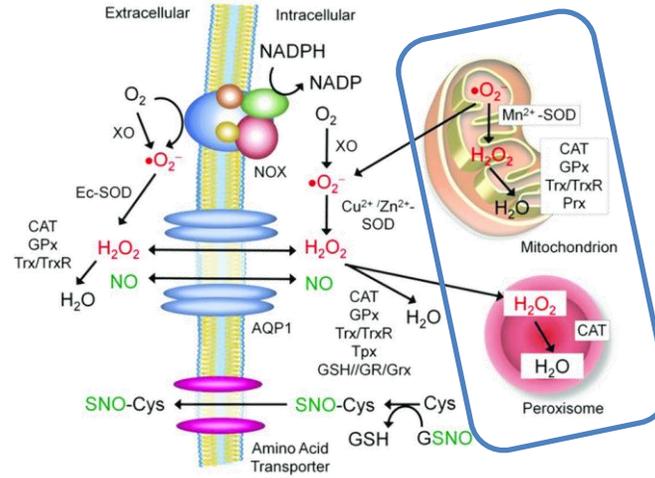


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# RESULTS

## Stress Ossidativo



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# RUCOLA – BORTAN

CROP: **Rucola** (var. Pamela - Clause)

CRO: CREA-OFA – CNR-ISA

Location: Battipaglia (SA)

Target: *Parametri morfometrici/Qualità/VOC's*



## TREATMENTS TABLE

Treatments	Dose rate	Application code
UNTREATED CHECK	-	-
BORTAN	10 l/ha	A (10gg post-semina)

Harvest: 7gg DA-A

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# RUCOLA – BORTAN



Artide

## Influence of Plant-Based Biostimulant (BORTAN) on Qualitative and Aromatic Traits of Rocket Salad (*Diplotaxis tenuifolia* L.)

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**Abstract:** In this study, the influence of a new plant-based biostimulant (Bortan) on physiological and aromatic traits of rocket (*Diplotaxis tenuifolia* L. var. Pamela) was monitored by evaluating physico-chemical parameters (fresh and dry weight, leaf color and chlorophyll content) and biochemical traits (total phenolic compound (TP), total flavonoids (TF), ascorbic acid (AA) and antioxidant activity (AOX)). Volatile profiles were also analyzed by headspace solid-phase microextraction coupled to gas chromatography–mass spectrometry, allowing the detection of 32 volatiles belonging to 5 chemical classes. Compared to the control, Bortan application enhanced leaf pigment content, including chlorophyll a, b and carotenoids (+10%, +16% and +28%, respectively) and increased TP (+34%), TF (+26%), AA (+19%) amounts and AOX value (+16%). Principal component analysis revealed a significant discrimination between the two samples. Specifically, treated samples were mainly associated with “green-leaf” volatiles, namely hexanal and 2-hexenal, 3-hexenal and 1-penten-3-one, while control rocket was directly correlated with several alcohols and to all isothiocyanates, associated with the sulfur-like odor of rocket. These findings can add further support, both for farmers and the agro-food industry, in choosing PBs as a new and sustainable practice in complementing enhanced yields with premium-quality produce. To confirm these preliminary data, further experiments are needed by enlarging the sample size, testing different concentrations of Bortan and/or using other food crops.

**Keywords:** *Diplotaxis tenuifolia* L.; plant-based biostimulant; sustainable horticulture; nutritional quality; volatile organic compounds (VOCs)

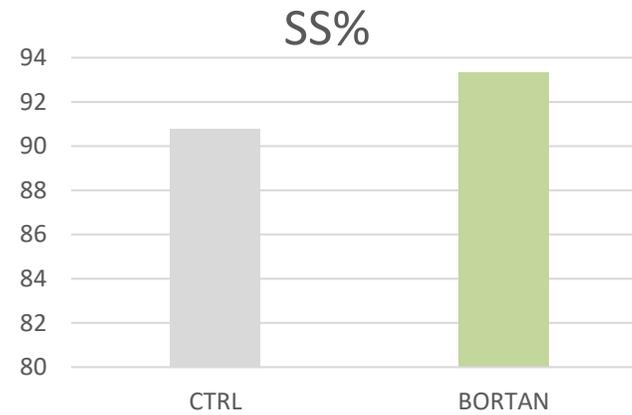
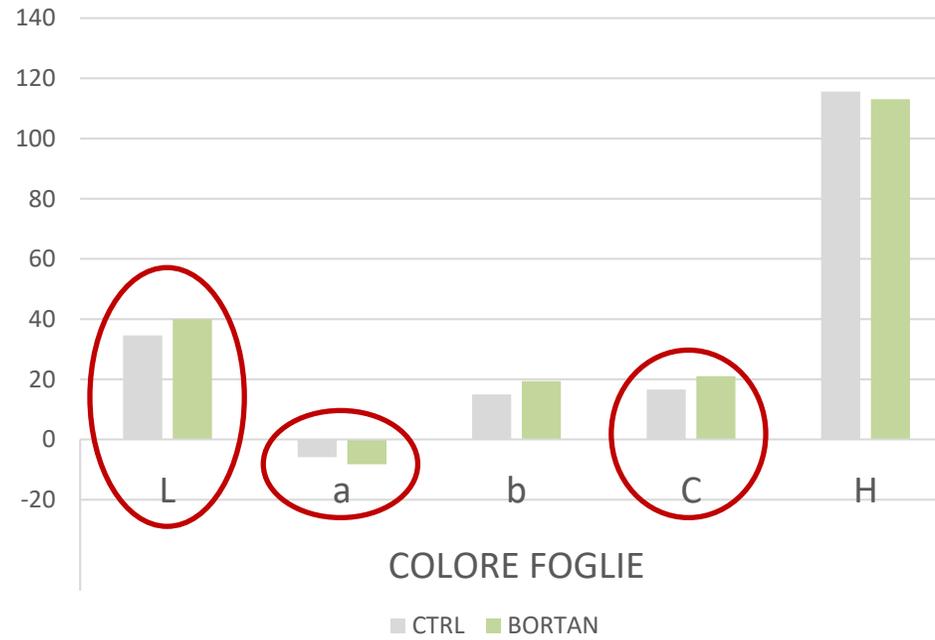


**Citation:** Malorni, L.; Cozzolino, R.; Magri, A.; Zampella, L.; Petriccione, M. Influence of Plant-Based Biostimulant (BORTAN) on Qualitative and Aromatic Traits of Rocket Salad (*Diplotaxis tenuifolia* L.). *Plants* **2023**, *12*, 730. <https://doi.org/10.3390/plants12040730>

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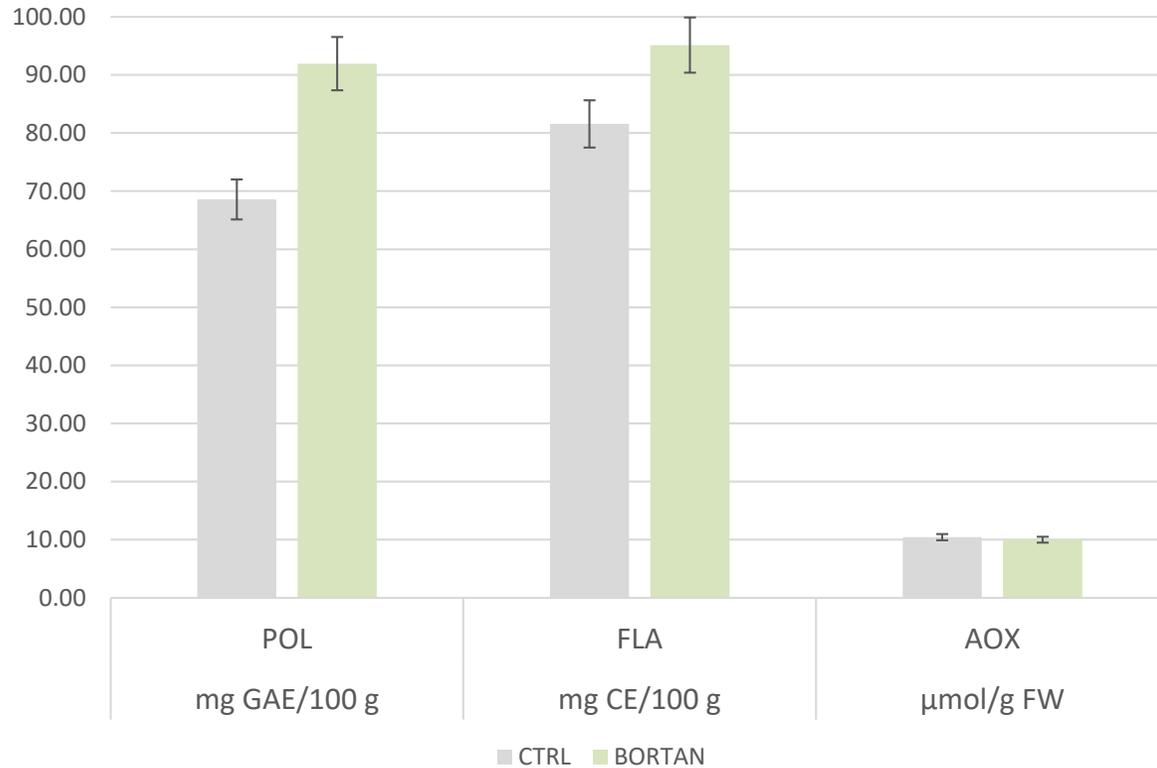
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# RESULTS

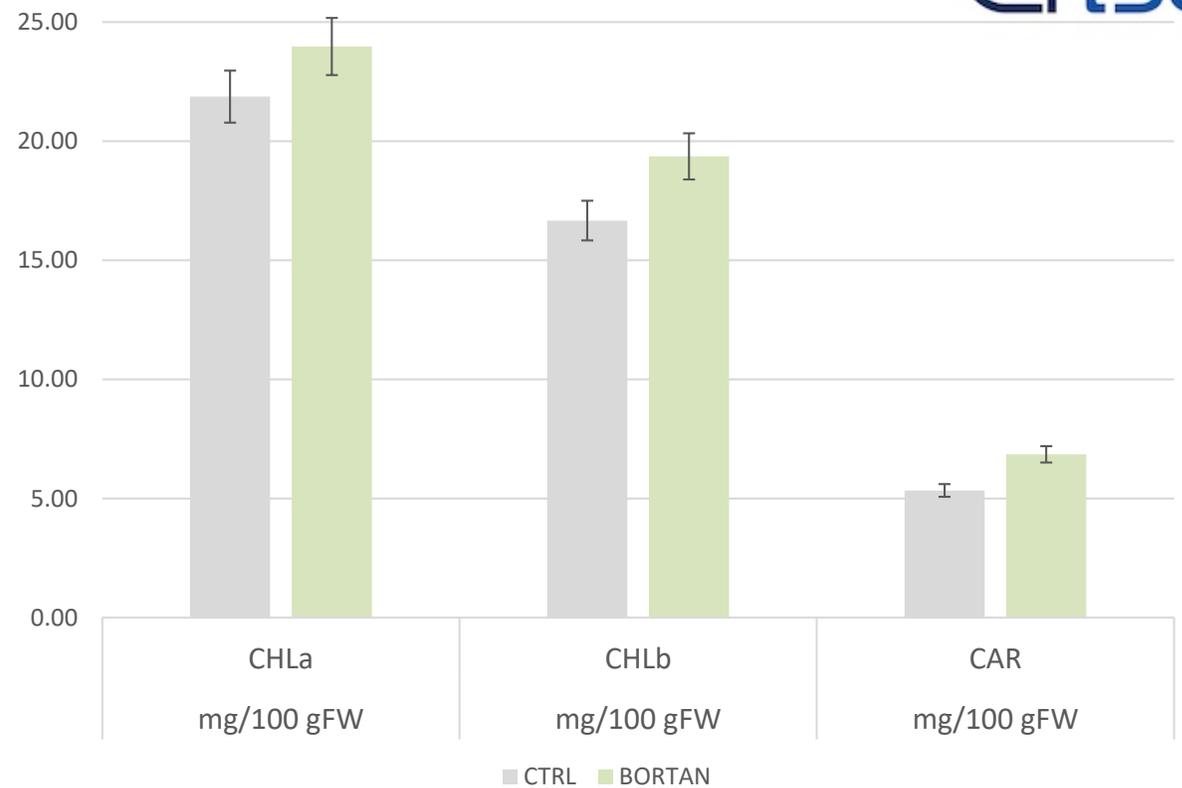


# RESULTS

## PARAMETRI QUALITATIVI



## PIGMENTI FOTOSINTETICI



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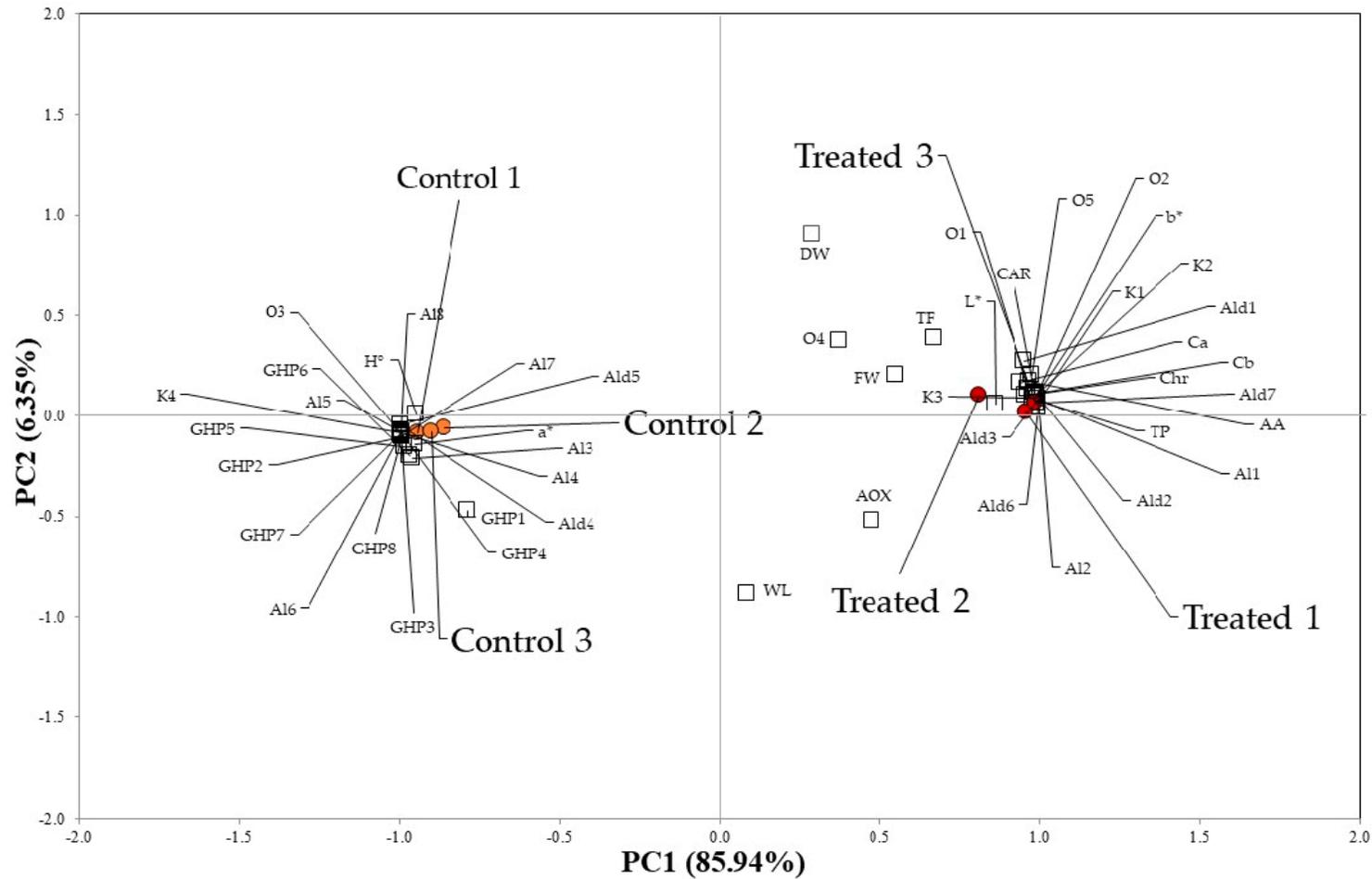
# RESULTS

Metabolites	Code	C_A	C_B	C_C	T_A	T_B	T_C
3-Pentanone	K1	2,82	2,80	2,95	4,06	4,08	4,07
1-Penten-3-one	K2	4,68	4,96	4,34	15,67	15,14	15,85
Hexanal	K3	11,70	11,61	11,04	13,82	14,48	14,85
3-Octanone	K4	7,36	7,74	7,28	15,41	15,59	15,24
6-Methyl-5-hepten-2-one	K5	3,35	3,30	3,25	0,00	0,00	0,00
<i>cis</i> -3-Hexanal	Ald1	6,16	6,44	6,76	57,13	59,29	59,50
2-Hexenal	Ald2	245,57	245,70	245,17	722,58	722,56	722,83
Octanal	Ald3	1,70	1,89	1,78	0,00	0,00	0,00
Nonanal	Ald4	6,77	6,87	6,84	1,02	1,05	1,48
2,4-Heptadienal	Ald5	0,60	0,60	0,66	2,73	2,49	2,55
Decanal	Ald6	7,90	7,79	7,90	10,08	10,08	10,08
1-Penten-3-ol	Alc1	18,50	18,39	18,68	48,68	48,74	48,92
<i>cis</i> -2-penten-1-ol	Alc2	0,00	0,00	0,00	21,69	21,34	21,76
1-Hexanol	Alc3	8,51	8,42	8,75	6,60	6,82	6,22
<i>trans</i> -3-Hexen-1-ol	Alc4	8,89	8,77	8,29	2,91	2,66	2,71
<i>cis</i> -3-Hexen-1-ol	Alc5	381,18	383,38	382,28	148,55	146,24	149,86
<i>trans</i> -2-Hexen-1-ol	Alc6	60,94	60,89	60,88	23,66	23,38	23,79
2,6-Dimethylcyclohexanol	Alc7	1,10	1,11	1,20	0,00	0,00	0,00
Terpinen-4-ol	Alc8	1,50	1,55	1,53	0,00	0,00	0,00
Methyl thiocyanate	S1	6,60	6,13	6,16	5,77	5,72	5,17
3-Butenyl isothiocyanate	S2	2,51	2,33	2,39	0,00	0,00	0,00
Pentyl isothiocyanate	S3	15,00	15,22	15,74	3,14	3,13	3,14
4-Methylpentyl isothiocyanate	S4	84,41	84,23	84,31	70,22	70,63	70,12
Hexyl isothiocyanate	S5	18,52	18,46	18,81	15,42	15,51	15,13
3-Methylthiopropyl isothiocyanate	S6	11,40	11,48	11,78	10,39	10,27	10,18
Benzyl isothiocyanate	S7	7,05	7,02	7,03	1,90	1,91	1,90
2-Ethylphenyl isothiocyanate	S8	4,50	4,53	4,56	2,29	2,12	2,22
2-Ethylfuran	O1	4,72	5,17	4,26	7,94	7,26	7,60
1-Pentene-3-ethyl-2-methyl	O2	5,72	5,56	5,10	12,27	12,11	12,50
<i>cis</i> -3-Hexen-1-ol acetate	O3	38,06	38,07	38,15	1,88	1,78	1,26
Anisole	O4	10,38	10,50	10,15	10,44	10,48	10,38
5-Methylhexanenitrile	O5	2,48	2,74	2,41	5,39	5,48	5,97

ALDEIDI E CHETONI: VOC's responsabili dell'aroma (odore) in rucola. Nella tesi con Bortan risultano ampiamente più alti

TIOCIANATI ORGANICI: Solforati responsabili del gusto pungente in rucola. In Bortan sono sempre più bassi ad indicare che il trattato è più dolce

# RESULTS



**Figure 2.** Principal component analysis performed on Ca, Cb, CAR, TP, TF, AA, AOX and on the semi-quantitative data (% RPA) of all VOCs detected in the rocket leaves treated with Bortan (Treated) and in the untreated samples (Control) (Codes are reported in the text and in Tables 1–3).

# APPLICAZIONI

## SETTORI DI IMPIEGO

COLTURA	DOSE	EPOCA D'INTERVENTO
Fragola e Colture Orticole (serra e pieno campo)	10-15 l/ha	In fertirrigazione con un volume non inferiore ai 20000 l/ha: dal trapianto/semina e nel corso della stagione da 2 a 4 interventi a distanza di 10-15 gg
Fruttiferi	10-15 l/ha	In fertirrigazione con un volume non inferiore ai 20000 l/ha: dalla ripresa vegetativa e nel corso della stagione a distanza di 15 gg, da 2 a 4 interventi



Prodotto originale **DIACHEM**

**AVVERTENZE**  
Agitare bene prima dell'uso.

**TANICA**  
10 kg



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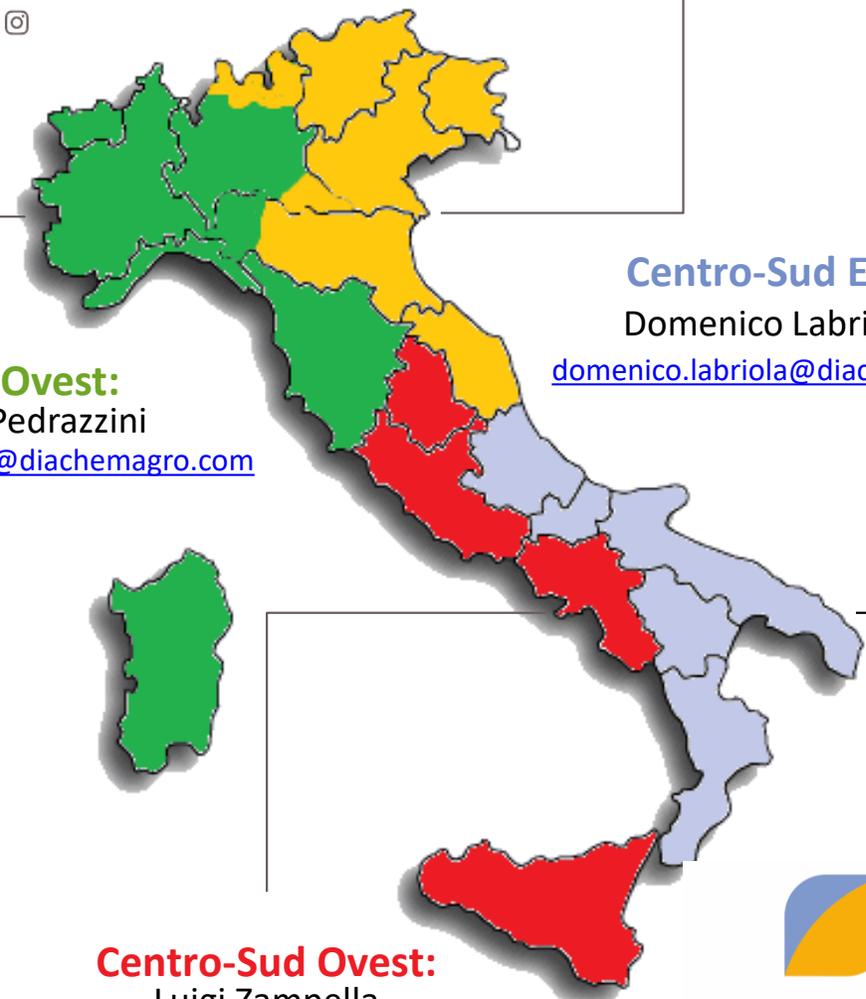
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grazie per la cortese attenzione

