



VALORBIO



SOSTANZE DI BASE PER LA PROTEZIONE SOSTENIBILE DELLE PIANTE

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28 Ottobre 2025

Napoli

Gold Tower Lifestyle Hotel



Farm to Fork Strategy

For a fair, healthy and environmentally-friendly food system

#EUGreenDeal



ENTRO IL 2030:

-50% sprechi di prodotti alimentari (inclusi frutta e ortaggi)

-50% di prodotti fitosanitari

+25% agricoltura biologica

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Bon Jovi - Wanted Dead Or Alive



Bon Jovi

8,64 Mln di iscritti



Basic Substances, a Sustainable Tool to Complement and Eventually Replace Synthetic Pesticides in the Management of Pre and Postharvest Diseases: Reviewed Instructions for Users

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Abstract: Synthetic pesticides are widely used to protect crops from pathogens and pests, especially for fruits and vegetables, and this may lead to the presence of residues on fresh produce. Improving the sustainability of agriculture and, at the same time, reducing the adverse effects of synthetic pesticides on human health requires effective alternatives that improve the productivity while maintaining the food quality and safety. Moreover, retailers increasingly request fresh produce with the amounts of pesticides largely below the official maximum residue levels. Basic substances are relatively novel compounds that can be used in plant protection without neurotoxic or immune-toxic effects and are still poorly known by phytosanitary consultants (plant doctors), researchers, growers, consumers, and decision makers. The focus of this review is to provide updated information about 24 basic substances currently approved in the EU and to summarize in a single document their properties and instructions for users. Most of these substances have a fungicidal activity (calcium hydroxide, chitosan, chitosan hydrochloride, *Equisetum arvense* L., hydrogen peroxide, lecithins, cow milk, mustard seed powder, *Salix* spp., sunflower oil, sodium chloride, sodium hydrogen carbonate, *Urtica* spp., vinegar, and whey). Considering the increasing requests from consumers of fruits and vegetables for high quality with no or a reduced amount of pesticide residues, basic substances can complement and, at times, replace the application of synthetic pesticides with benefits for users and for consumers. Large-scale trials are important to design the best dosage and strategies for the application of basic substances against pathogens and pests in different growing environments and contexts.

Citation: Romanazzi, G.; Orçonneau, Y.; Moumni, M.; Davillerd, Y.; Marchand, P.A. Basic Substances, a Sustainable Tool to Complement and Eventually Replace Synthetic Pesticides in the Management of Pre and Postharvest Diseases: Reviewed Instructions for Users. *Molecules* **2022**, *27*, 3484. <https://doi.org/10.3390/molecules27113484>
 Academic Editor: James Barker

DIAMO ALL'AMBIENTE
 UNA NUOVA IMPRONTA.
 CILIEGIE FIOR FIORE COOP:
 LA NOSTRA CILIEGINA SULLA TORTA
 NELLA RIDUZIONE DEI PESTICIDI



















DIAMO ALL'AMBIENTE UNA NUOVA IMPRONTA.
 CLEMENTINE ORIGINE COOP:
 NESSUNA CLEMENZA CON I PESTICIDI.



#coopambiente
 LA COOP SEI TU.

Table 5. Examples of requests from the retailer of the amount of the Maximum Residue Level (MRL) and Acute reference doses (ARfD).

| Retailer | Max. %MRL/Active Substance | Max. Sum %MRL/Sample | Max. %ARfD/Active Substance | Max. Sum %ARfD/Sample | Max. Number of Active Substances /Samples |
|------------------|---|----------------------|-----------------------------|-----------------------|---|
| ALDI/HOFER |  70% | 80% | 70% | 80% | 3–5 |
| ALBERT HEIJN |  50% | - | 50% | - | - |
| ASDA |  80% | - | - | - | - |
| BILLA |  100% | - | 100% | - | - |
| DOHLA |  - | 70% | - | 70% | 3–5 |
| EDEKA | 70% | - | 100% | - | 5 |
| EDEKA OWN BRANDS |  50% | - | 70% | - | 5 |
| GLOBUS |  70% | - | 70% | 100% | 5 |
| LIDL |  33.3% | 80% | 100% | - | 5 |
| KAUFLAND |  33.3% | 80% | 50% | 50% | 5 |
| NORMA |  - | 70% | - | 70% | 5 |
| METRO |  50% | 80% | 70% | 100% | 5 |
| MIGROS |  - | - | - | - | 6 |
| NETTO |  70% | - | 100% | - | 5 |
| REWE | 50% | 100% | 70% | 100% | 5 |
| REWE OWN BRANDS |  50% | 100% | 50% | - | 5 |
| TEGUT |  70% | - | 70% | - | Max. 4 (>0.01 mg/kg) |
| TENGEL MANN |  70% | 150% | 70% | 100% | - |

Pesticides residues in food: what's the situation in the EU?

Published: 14 May 2025 | 3 minutes read

Share:  

The risk from *pesticide* residues to human health remains low, in line with previous years, EFSA said in its latest annual report. EFSA analysed thousands of samples collected in 2023 from commonly consumed products.



From this subset of samples analysed under the EU MACP, 99% were found to be compliant with EU legislation. This finding is consistent with the results obtained in [2020](#) (99.1%), when the same selection of products was sampled.

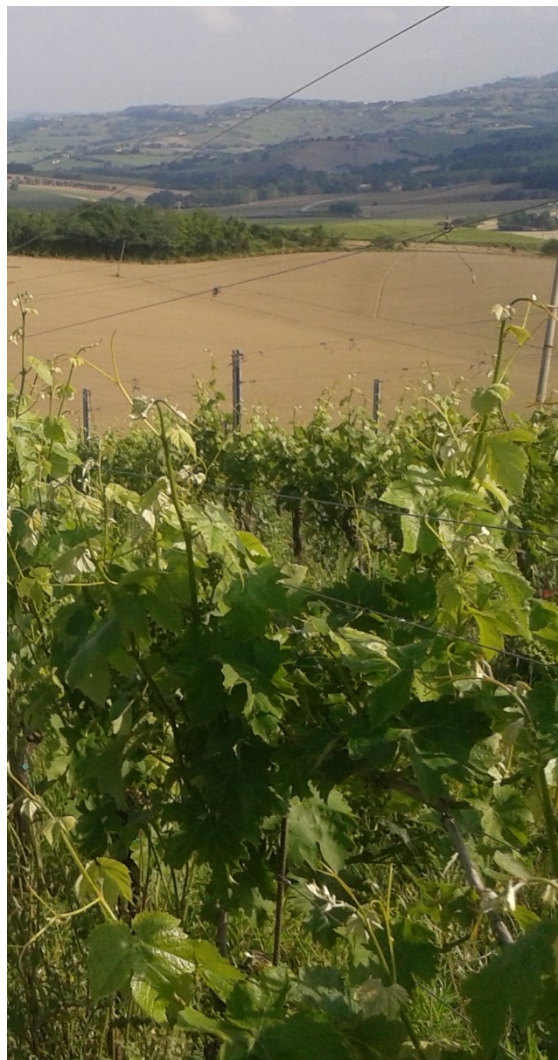
Of the 2023 samples, 70% were free of quantifiable levels of residues, while 28% contained one or more residues within legal limits. Maximum residue levels (MRLs) were exceeded in 2% of samples, of which 1% were non-compliant after taking into account the measurement *uncertainty*.

[Pesticides residues in food: what's the situation in the EU? | EFSA](#)

PIANTE E STRESS

Stress abiotici

Biostimolanti
(parte del Reg. sui fertilizzanti 2019/1009)



Stress biotici

Prodotti per la protezione delle piante
(Reg. 2009/1107)

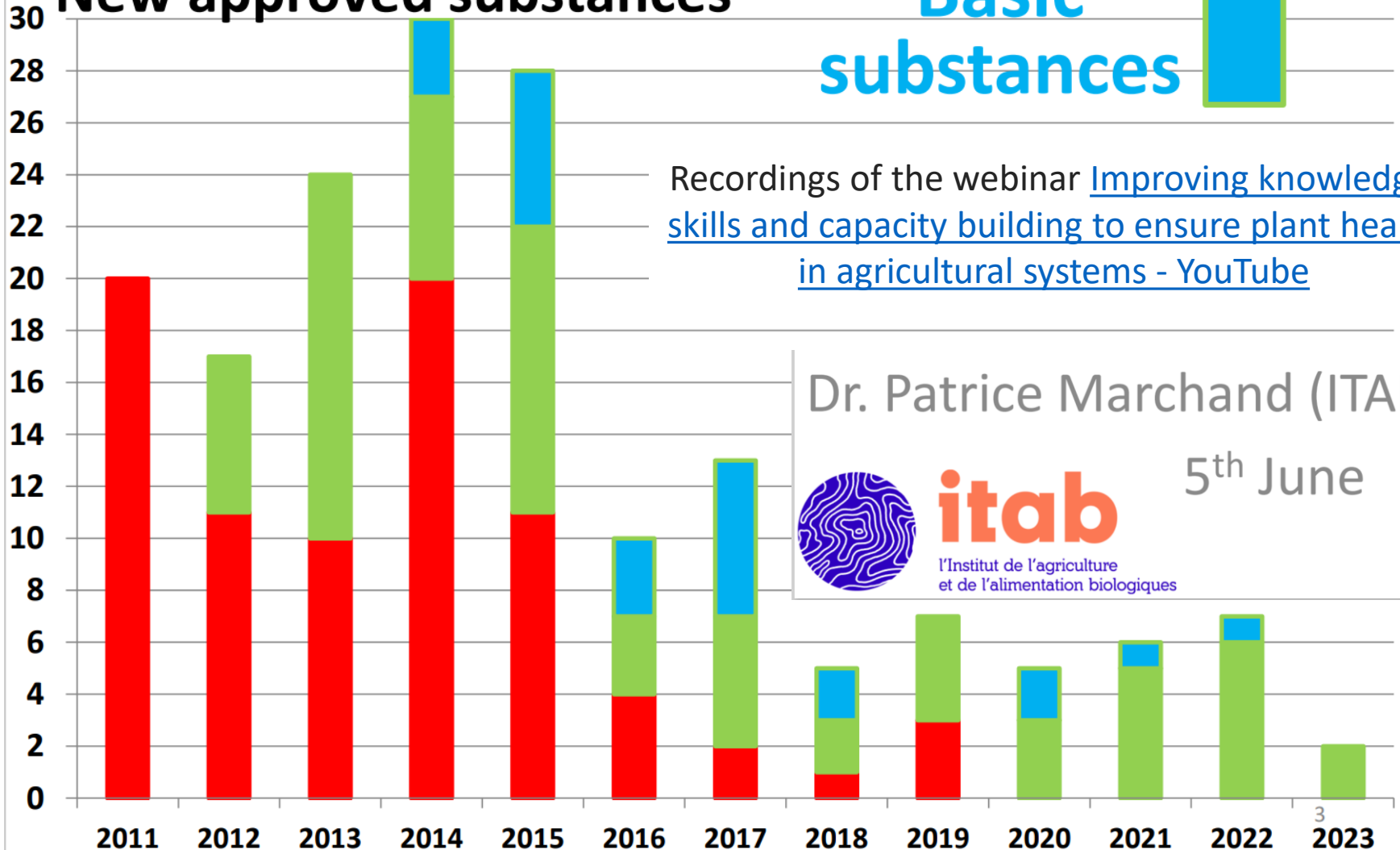
Art. 22 – Sostanze a basso rischio (registrate per 15 anni; 10 anni per gli altri PPP)

Art. 23 – Sostanze di base (registrate una volta per sempre)

Biocontrol / chemicals : stats

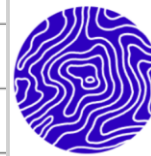
New approved substances

Basic substances



Recordings of the webinar [Improving knowledge, skills and capacity building to ensure plant health in agricultural systems - YouTube](#)

Dr. Patrice Marchand (ITAB)



itab

L'Institut de l'agriculture et de l'alimentation biologiques

5th June

Consultazione EU su *fast track* per la registrazione di agenti di biocontrollo e sostanze naturali

In preparation

Call for evidence

Feedback period

16 September 2025 - 14 October 2025

Feedback: Open

Upcoming

Commission adoption

Planned for

Fourth quarter 2025

Feedback: Upcoming

About this initiative

Summary

This initiative aims to increase the competitiveness of EU farmers and the food and feed industry, as well as reduce the administrative burden on Member States authorities related to marketing authorisations of products. It will:

- accelerate access to the EU market for biocontrol substances and products
- simplify and clarify regulatory requirements on plant protection products, biocidal products, feed additives, food hygiene and official controls as well as other measures to simplify EU food law.

Topic

Food safety

Type of act

Proposal for a regulation

Call for evidence

Feedback: Open

Feedback period

16 September 2025 - 14 October 2025 (midnight Brussels time)

The Commission would like to hear your views.

This call for evidence is open for feedback. Your input will be taken into account as we further develop and fine-tune this initiative. Feedback received will be published on this site and therefore must adhere to the [feedback rules](#).

10 October 2025 | EU citizen

[Isabel Garcia \(Portugal\)](#)

I am a European citizen who believes protecting farmers and nature go hand in hand. Allowing more toxic pesticides on our fields threatens not only insects and birds but also human health. The Commission should support farmers in reducing pesticides and building resilience through healthy soils and agroecology instead of pushing them toward more chemical dependency.

10 October 2025 | EU citizen

[Helena Sobral \(Portugal\)](#)

I am a European citizen who believes protecting farmers and nature go hand in hand. It is unacceptable that short-term economic interests are placed above the safety of citizens, farmers, and ecosystems. I urge the Commission to put the health of citizens, farmworkers, and nature above the profits of the pesticide industry.

10 October 2025 | EU citizen

[Péter Kóbor \(Hungary\)](#)

A peszticidok beszivárognak a talajvízbe és a felszíni vizekbe, és szennyezik az ivóvízkészleteinket. - - Tartós fennmaradásuk miatt a jövő generációi szennyezett erőforrásokkal és kevesebb tiszta vízhez való hozzáféréssel lesznek majd kénytelenek szembesülni. Elutasítom a "növényvédőszerekre" vonatkozó szabályozás bármilyen gyengítését az úgynevezett bürokráciacsökkentés érdekében.

10 October 2025 | EU citizen



[Véronique Van den Eynde \(Belgium\)](#)

I am a European citizen who believes protecting farmers and nature go hand in hand. We depend on other living beings for our food and our health. Pesticides contribute to the dramatic decline in biodiversity. Bees, birds, butterflies, and many other species are disappearing. It is time to put an end to not only the use of pesticides and other harmful products but also the production of these substances. We need to tackle problems at their source...

Fast track attesa per metà dicembre 2025

COME SI CALCOLA LA QUANTITÀ DI PRODOTTI FITOSANITARI UTILIZZATI?

Indicatore armonizzato UE (HR1)

| Sostanze a basso rischio | | Sostanze che non rientrano nelle altre categorie | | Sostanze candidate alla sostituzione | | Usi eccezionali |
|---|---|--|--|--|--|-----------------|
| A | B | C | D | E | F | G |
| Microrganismi | S.a. chimiche | Microrganismi | S.a. chimiche | Non classificate come: Canc. Cat 1A o 1B e/o Tossiche per riproduzione 1A o 1B e/o Interferenti endocrini | Classificate come: Canc. Cat 1A o 1B e/o Tossiche per riproduzione 1A o 1B e/o Interferenti endocrini (esp. trascurabile per salute umana)) | |
| <div style="border: 1px solid black; padding: 5px; display: inline-block; color: red; font-weight: bold;">Non considerate le sostanze di base</div> | | | | | | |
| |  Zolfo | |  Rame | | | |
| | * \cong 10 | | * \cong 350 | | * \cong 70 | |
| 3 | 7 | 40 | 359 | 71 | 12 | ? |
| 1 | | 8 | | 16 | | 64 |

*Pasquale Falzarano - Bologna, 28 novembre 2022

Floriano Mazzini, 2021

Le sostanze di base sono normalmente utilizzate nella dieta e quindi non bisogna dimostrare che non hanno effetti negativi su uomo e ambiente

Generalmente non hanno limite massimo di residuo (LMR) e intervallo di sicurezza

Non dovendo sostenere le prove tossicologiche ed ecotossicologiche per la registrazione, il costo di registrazione è pari a circa 50000 Euro (inclusa la registrazione per il biologico), ed il periodo più breve (2 anni)



Review

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Basic Substance pathway



Review

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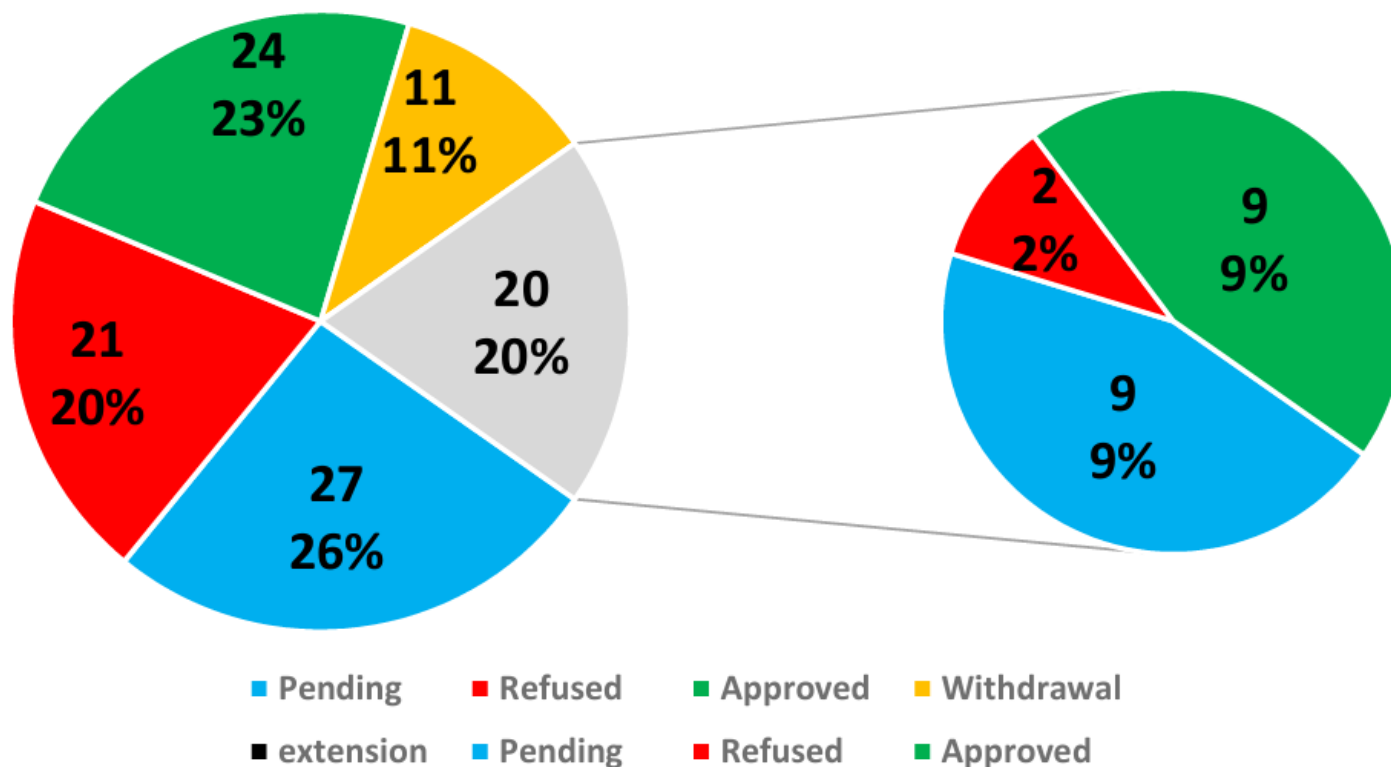


Figure 1. Total of the basic substance applications (BSA) and extensions presented by the results (%).

Sostanze di base approvate per la protezione delle piante

Estratto di bulbo di *Allium cepa*, *Allium fistulosum* processato, birra¹, idrossido di calcio, chitosano*, chitosano cloridrato², carbone argilloso³, latte vaccino⁴, fosfato diammonico⁵, *Equisetum arvense* L., fruttosio², perossido di idrogeno, L-cysteina⁶, lecitine, idrossido di magnesio, polvere di semi di senape, olio di cipolla⁷, pellet essiccato di *Onobrychis viciifolia* (lupinella)⁸, corteccia di *Salix* spp., cloruro di sodio², bicarbonato di sodio^{9,*}, saccarosio², olio di girasole, talco E553B¹⁰, *Urtica* spp.¹¹, aceto⁹, estratto di semi di *Vitis vinifera* L., siero⁴

Fungicida; fungicida e battericida; fungicida e insetticida

¹Molluschicida; ²elicitore; ³protettiva; ⁴virucida; ⁵attrattivo; ⁶insetticida; ⁷repellente, maschera odori; ⁸nematicida; ⁹erbicida; ¹⁰insettifugo, fungifugo; ¹¹acaricida

*Approvata per applicazioni in postraccolta su prodotti ortofrutticoli freschi

(European Union Pesticide Database, 2025;
Romanazzi et al., 2022 *Molecules*)



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Molecules **2022**, *27*, 3484

<https://doi.org/10.3390/molecules27113484>

Sostanze di base

Estratto di bulbo di *Allium cepa*, *Allium fistulosum* processato, birra, idrossido di calcio, chitosano, chitosano cloridrato, carbone argilloso, latte vaccino, fosfato diammonico, *Equisetum arvense* L., fruttosio, perossido di idrogeno, L-cysteina, lecitine, idrossido di magnesio, polvere di semi di senape, olio di cipolla, pellet essiccato di *Onobrychis viciifolia* (lupinella), corteccia di *Salix* spp., cloruro di sodio, bicarbonato di sodio, saccarosio, olio di girasole, talco E553B, *Urtica* spp., aceto, estratto di semi di *Vitis vinifera* L., siero di latte

Su 28 sostanze di base, 16 sono approvate su vite e 5 anche su fragola e piccoli frutti per la gestione delle malattie fungine

Caratteristiche delle sostanze di base

- Etichettate con il nome del principio attivo
- Generalmente approvate in agricoltura biologica

Esempio di *review report* - olio di girasole

| Nome | Regolamento europeo d'approvazione | Istituto richiedente | Colture approvate in fase di registrazione | Azione svolta | Targets | Metodi di applicazione |
|------------------|------------------------------------|----------------------|--|---------------|---------|-------------------------------|
| Olio di girasole | Reg. (UE) 2016/1978 | ITAB | Pomodoro | Fungicida | Oidio | Applicazione fogliare (spray) |

| Periodo d'applicazione | Numero min e max di trattamenti | Intervallo fra trattamenti | Dosi d'applicazione | Volume d'irrorazione | Intervallo di sicurezza | Eventuali note |
|-------------------------|---------------------------------|----------------------------|--------------------------|----------------------|-------------------------|-----------------------------|
| BBCH 32-37 / BBCH 61-71 | Da 2 a 4 | 8 | 0,092 kg/hL – 0,46 kg/hL | Da 500 a 1000 L/ha | 2 | No trattamenti in fioritura |

Registrazione delle sostanze di base su vite

| Sostanza di base | Malattia/e | Tipo di applicazione | Epoche d'impiego | Numero di applicazioni |
|--------------------------------|---|--------------------------------|-------------------------------|------------------------|
| Carbone argilloso | Complesso del mal dell'esca | Interramento al suolo | - | 1 |
| Latte vaccino | Oidio | Fogliare | Da BBCH 07 a 57 | Da 3 a 6 |
| Fruttosio | Peronospora | Fogliare, di mattina presto | Da BBCH 10 a 57 | Fino a 12 |
| Saccarosio | | | | |
| Lecitine | Peronospora ed oidio | Fogliare | Da BBCH 11 a 85 | Da 3 a 12 |
| Chitosano cloridrato | Elicitore per malattie fungine e batteriche | Fogliare | Da BBCH 10 a 79 | Da 4 a 8 |
| Chitosano | | | | |
| Idrogenocarbonato di sodio | Oidio | Con irroratrice a getto d'aria | Da BBCH 12 a 89 | Da 1 a 8 |
| <i>Equisetum arvense</i> | Peronospora ed oidio | Fogliare | Da BBCH 10 a 57 | Da 2 a 6 |
| Talco E553B | Oidio | Fogliare | Da BBCH 20 | Da 2 a 5 |
| Corteccia di <i>Salix</i> spp. | Peronospora ed oidio | Fogliare | Da BBCH 10 a 57 | Da 2 a 6 |
| Cloruro di sodio | Peronospora | Fogliare | Da BBCH 10 a 80 | Da 1 a 8 |
| | Oidio | Fogliare | Da BBCH 10 a 57 | Da 1 a 2 |
| <i>Urtica</i> spp. | Peronospora | Fogliare | Da primavera/estate a BBCH 89 | Da 1 a 6 |
| Siero di latte | Oidio | Fogliare, al mattino | Da BBCH 10 a 57 | Da 3 a 5 |
| Idrossido di magnesio E528 | Peronospora, oidio e marciume nero | Fogliare | Da BBCH 09 a 85 | 1 |

La gestione della peronospora della vite in biologico può richiedere anche 10-15 applicazioni di rame all'anno



Use of basic substances and other natural compounds as alternatives to synthetic fungicides for the control of grapevine downy and powdery mildews

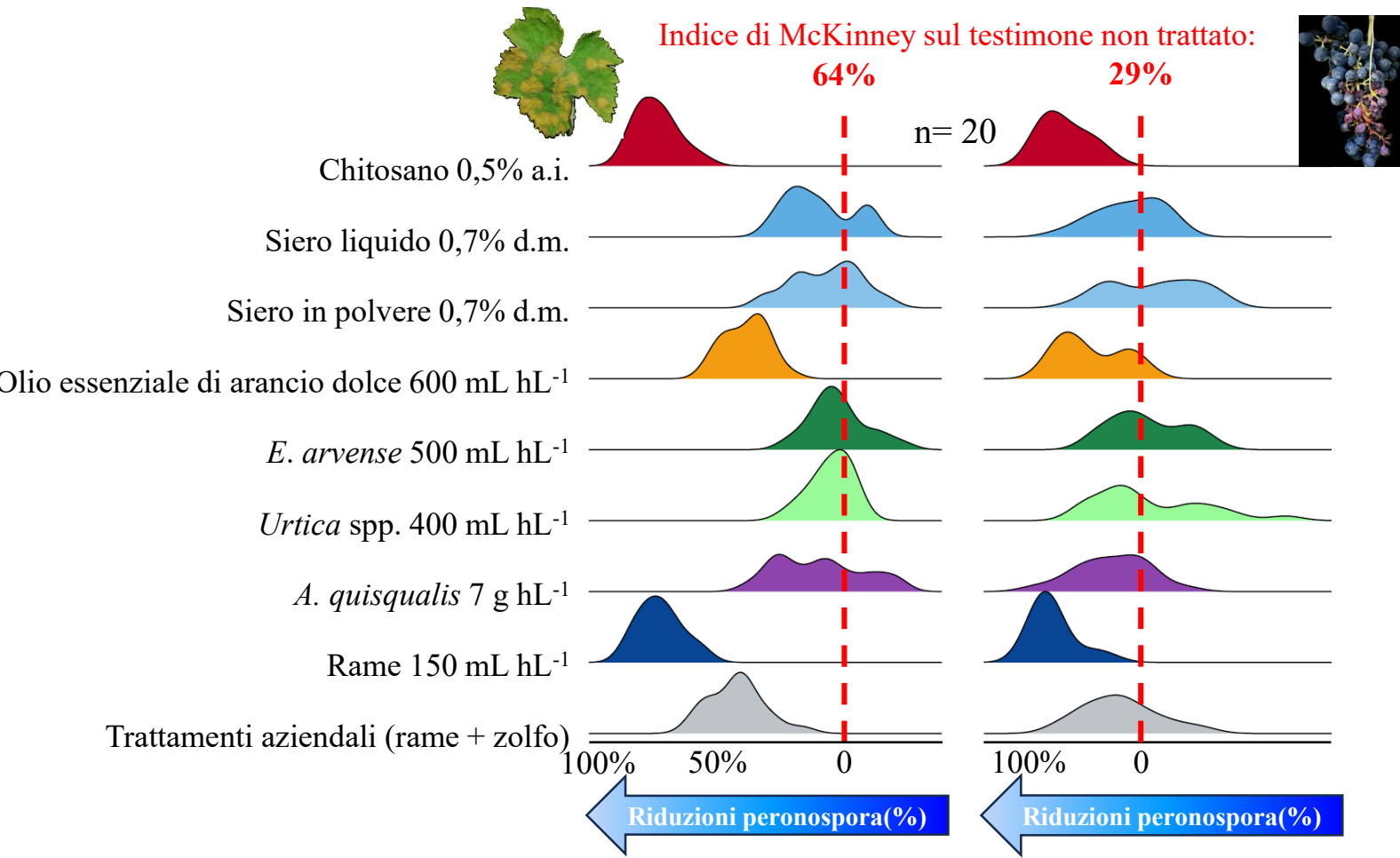
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Published Online: 2 Jun 2025 | <https://doi.org/10.1094/PDIS-11-24-2480-RE>

Distribuzione delle riduzioni della peronospora rispetto al testimone non trattato

Rilievi del:

3 luglio 2023 (BBCH77) per le **foglie** (sinistra) e 16 giugno 2023 (BBCH71) per i grappoli (destra)



Use of basic substances and other natural compounds as alternatives to synthetic fungicides for the control of grapevine downy and powdery mildews

Simone Piancatelli, Marwa Moumni, Gabriele Cantalamessa, Sarah Mojela Makau, Mehdiye Tunc, Yann Davillerd, Eva Pilar Pérez-Álvarez, Teresa Garde-Cerdan, and Gianfranco Romanazzi ✉

Published Online: 2 Jun 2025 | <https://doi.org/10.1094/PDIS-11-24-2480-RE>

Infezioni peronosporiche su viti trattate con chitosano allo 0,5% e testimone non trattato



Foto del 10 luglio 2023 (BBCH79), dopo 8 applicazioni

Fungicide activity of milk and whey powders towards *Erysiphe necator*, the causal agent of powdery mildew of grapevine

Bugiani¹, R., Cavazza^{2*}, F., Landi², M., Preti², M.

¹ Servizio Fitosanitario – Regione Emilia-Romagna - Via A. da Formigine, 3, 40129 Bologna, Italy

² Astra Innovazione e Sviluppo Test Facility – Via Tebano, 45, 48018 Faenza, Italy

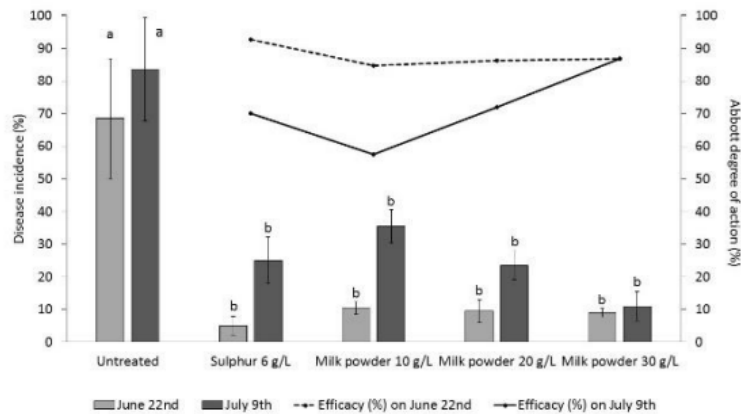


Figure 1: Disease incidence on grape bunches (histograms) and tested products efficacy (lines) recorded in 2018.

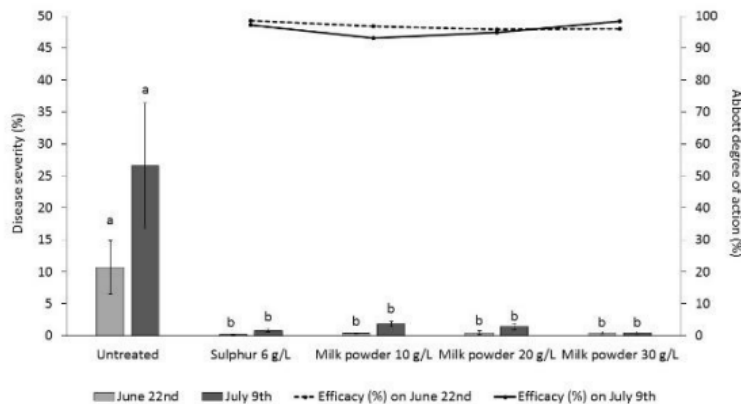


Figure 2: Disease severity on grape bunches (histograms) and tested products efficacy (lines) recorded in 2018.

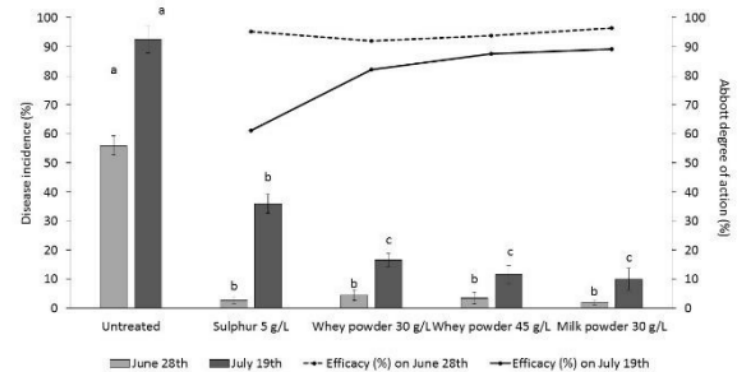


Figure 3: Disease incidence on grape bunches (histograms) and tested products efficacy (lines) recorded in 2019.

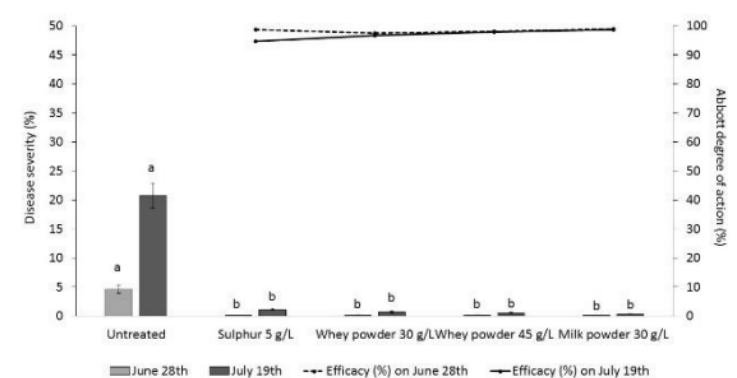


Figure 4: Disease severity on grape bunches (histograms) and tested products efficacy (lines) recorded in 2019.

Use of basic substances and other natural compounds as alternatives to synthetic fungicides for the control of grapevine downy and powdery mildews

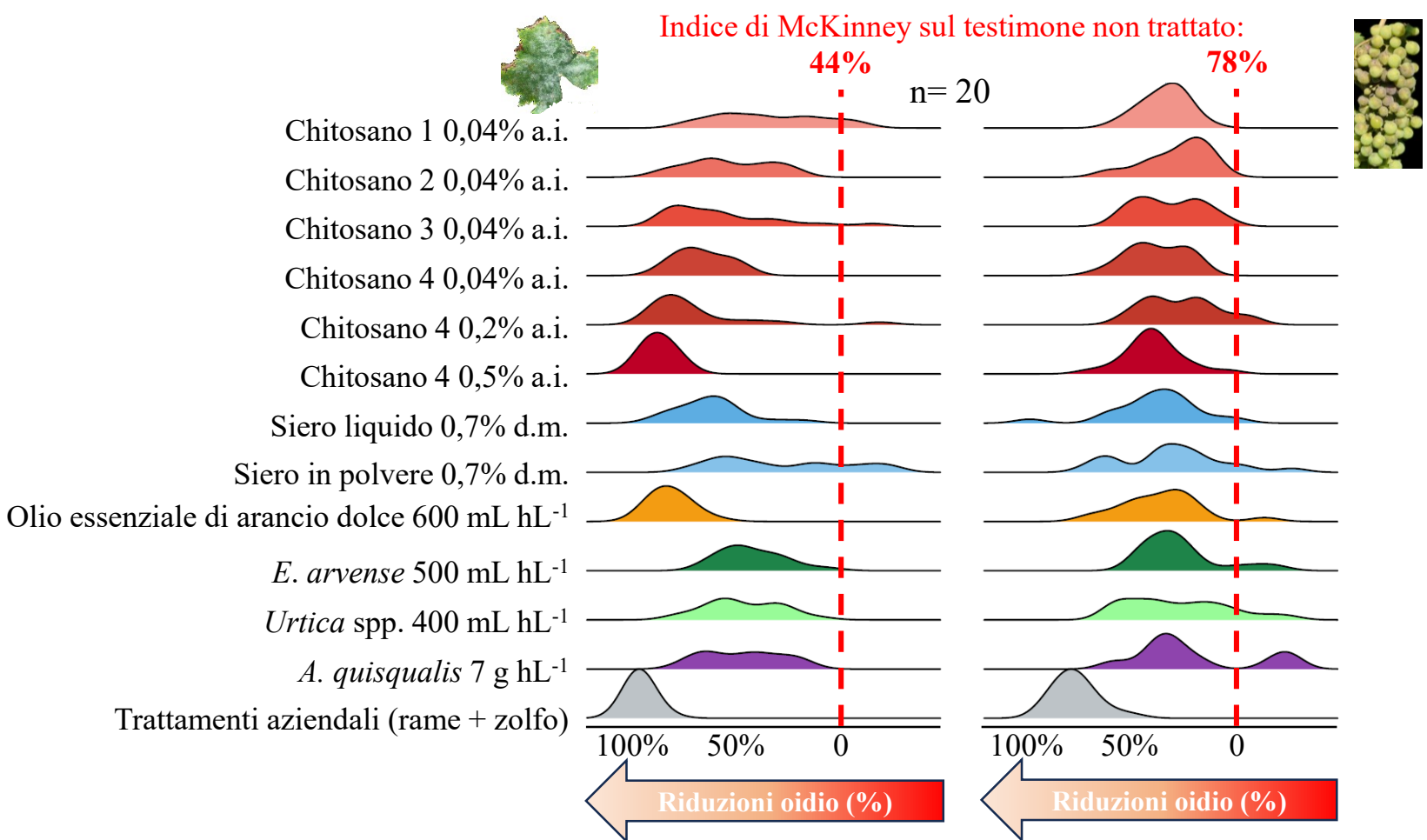
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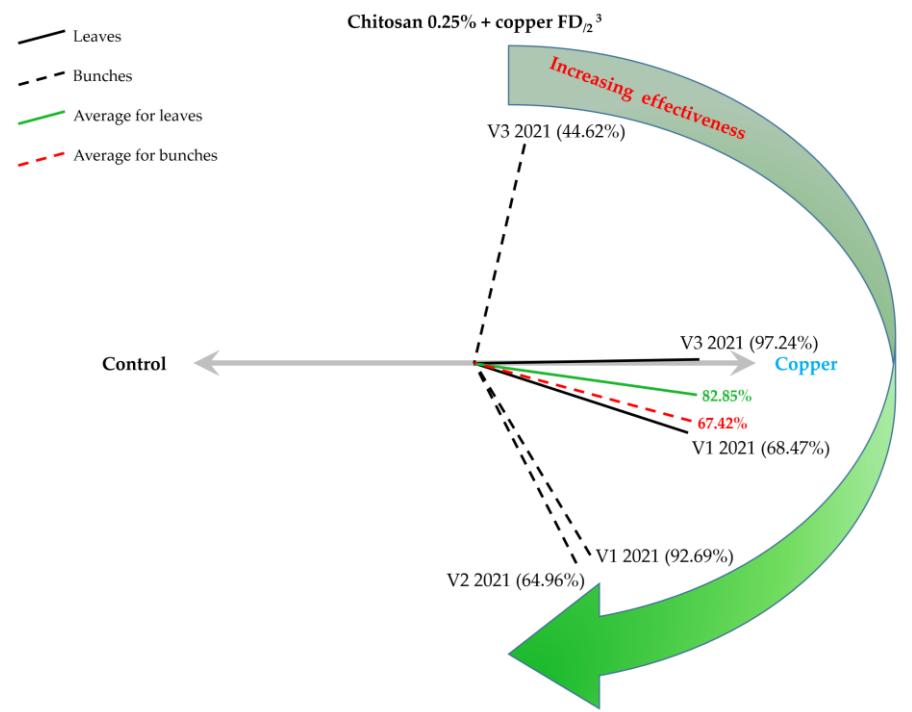
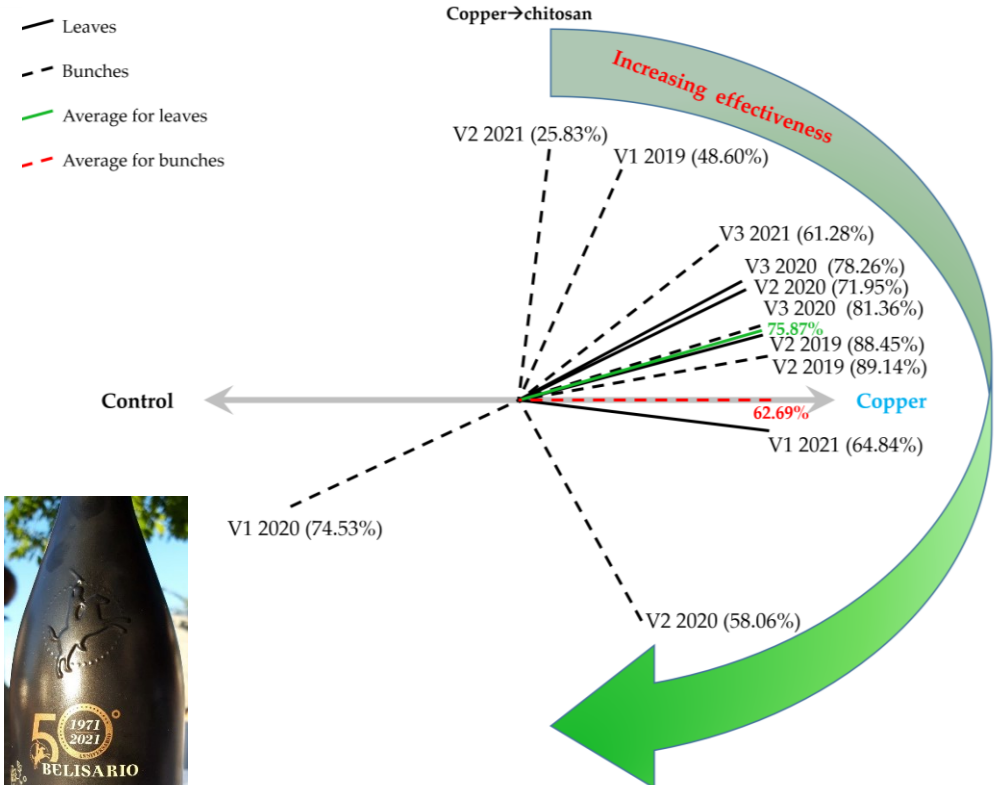
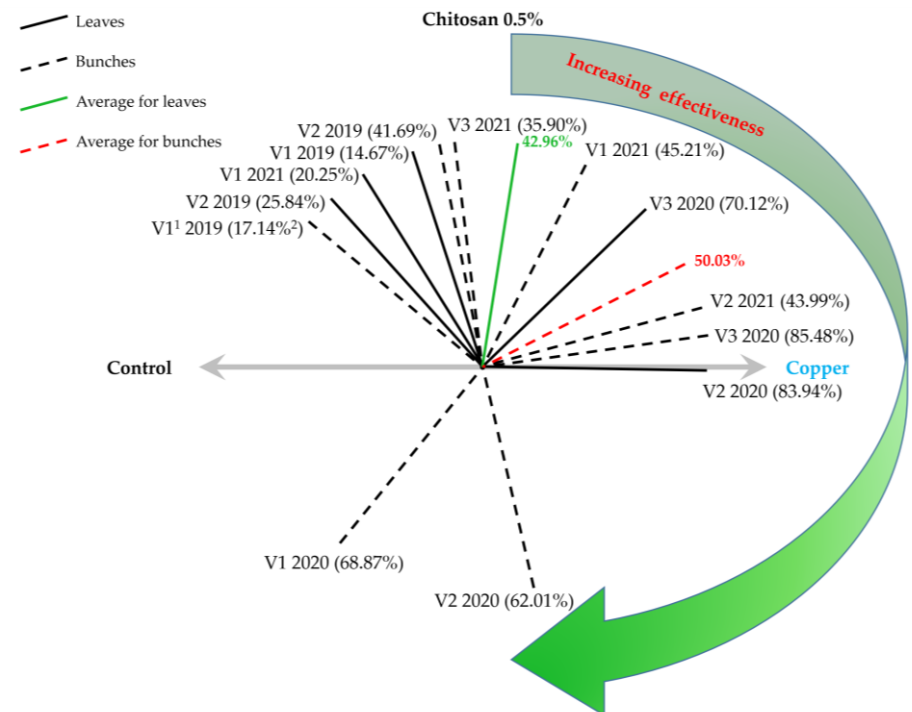
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Distribuzione delle riduzioni dell'oidio rispetto al testimone non trattato

Rilievi del:

31 agosto 2022 (BBCH89) su foglie (sinistra) e 13 luglio 2022 (BBCH79) su grappoli (destra)





Journal of Cleaner Production
Volume 451, 20 April 2024, 142131



Applications of chitosan alone, alternated or combined with copper for grapevine downy mildew management in large scale trials

Gianfranco Romanazzi ^a, Simone Piancatelli ^a, Roberto Potentini ^b,
Giuliano D'Ignazi ^c, Marwa Moumni ^a



Attività realizzata con il contributo del Programma di Sviluppo Rurale della Regione Marche 2014/2020 - Misura 16.1.A.1 - Progetto ID 28779

VITINNOVA 2019 - 2023
AFFRONTARE CON L'INNOVAZIONE
LE NUOVE SFIDE DELLA VITIVINICOLTURA




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Postharvest Biology and Technology

journal homepage: www.elsevier.com/locate/postharvbio

Volatile organic compounds released by chitosan formulations present diverse chemical composition and produce differential effects on postharvest pathogens

Samuel Álvarez-García^{a,b}, Ilaria D'Isita^c, Onofrio Marco Pistillo^c, Marwa Moumni^a, Giacinto Salvatore Germinara^c, Gianfranco Romanazzi^{a,*} 

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^b Plant Physiology Area, Engineering and Agricultural Sciences Department, Universidad de León, León, Spain

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Table 1

Information regarding the chitosan formulations tested in the present study including their assigned codes.

| Code | Active principle | Commercial concentration % (w/v) | Source | Product | Company | Tested concentrations |
|------|------------------------|----------------------------------|--------------------------|---------------------|------------------------------------|-----------------------|
| CH1 | Chitosan hydrochloride | 5 % | crustaceans & mollusks | Prevatect | Ascenza Agro S.A, Italy | 1 %, 5 % |
| CH2 | *COS-OGA | 1.25 % | fungi-plants | Ibisco | Gowan Srl, Faenza, Italy | 1 %, 1.25 % |
| CH3 | Chitosan | 1.9 % | crustaceans | Biorend | Bioplanet Srl, Cesena, Italy | 1 %, 1.90 % |
| CH4 | Chitosan hydrochloride | 5 % | crustaceans & mollusks | Serbios | Serbios Srl, Badia Polesine, Italy | 1 %, 5 % |
| CH5 | Chitosan hydrochloride | 50 % | crustaceans | Chitosano denso | Agrilaete Srl, Palmanova, Italy | 1 %, 5 % |
| CH6 | Chitosan hydrochloride | 11.5 % | crustaceans | Kitae | GreenIMPULSE | 1 %, 5 %, 11.5 % |
| CH7 | Chitosan | 10 % | <i>Aspergillus niger</i> | KITOGREEN DIRECT F1 | Kitozyme SA | 1 %, 5 %, 10 % |
| CH8 | Chitosan | 85 % | <i>Aspergillus niger</i> | KITOGREEN MASTER | Kitozyme SA | 1 %, 5 %, 10 % |
| CH9 | Chitosan | 10 % | <i>Aspergillus niger</i> | KITOGREEN DIRECT F2 | Diachem S.p.A. | 1 %, 5 %, 10 % |

*COS (Chito-oligosaccharides) - OGA (oligo-galaturonides).



Chitosan inhibits the growth of *Penicillium digitatum* and *Penicillium italicum* and protects oranges from green and blue mold during postharvest

Simone Piancatelli^a, Adrian O. Sbodio^b, Thomas Bruno Michelon^c, Muyun Tsen^b, Mary Carmen Carranza-Rodriguez^b, Elia Gutierrez-Baeza^b, Gianfranco Romanazzi^{a,*}, Barbara Blanco-Ulate^{b,*}

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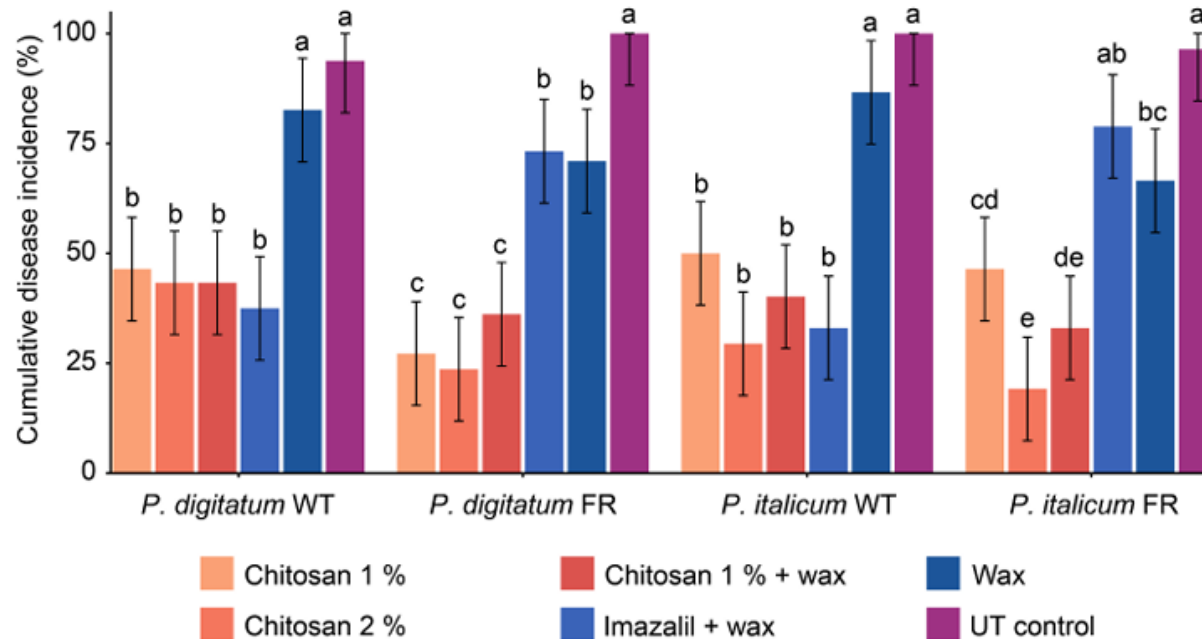


Fig. 2. Chitosan postharvest application reduced green and blue mold incidence regardless of fungicide resistance in *Penicillium* spp. strains. Cumulative disease incidence (%) after 14 dpi at 12.5 °C and under high (95 %) relative humidity was assessed in oranges treated with chitosan 1 %, 2 %, chitosan 1 % + wax, imazalil + wax, and wax alone following contact-inoculation with *P. digitatum* and *P. italicum* fungicide-susceptible (wild type: WT) and fungicide-resistant (FR) strains. Number of oranges per treatment: 30. Data are expressed as means \pm standard error. Different letters indicate significant differences among treatments within strains as determined by two-way ANOVA followed by Tukey post hoc test ($p \leq 0.05$). **UT control:** untreated control.



Antifungal activity of volatile organic compounds from essential oils against the postharvest pathogens *Botrytis cinerea*, *Monilinia fructicola*, *Monilinia fructigena*, and *Monilinia laxa*

Samuel Álvarez-García^{1,2}, Marwa Mounmi¹ and Gianfranco Romanazzi^{1*}

¹Department of Agricultural, Food and Environmental Sciences, Marche Polytechnic University, Ancona, Italy; ²Plant Physiology Area, Engineering and Agricultural Sciences Department, Universidad de León, León, Spain

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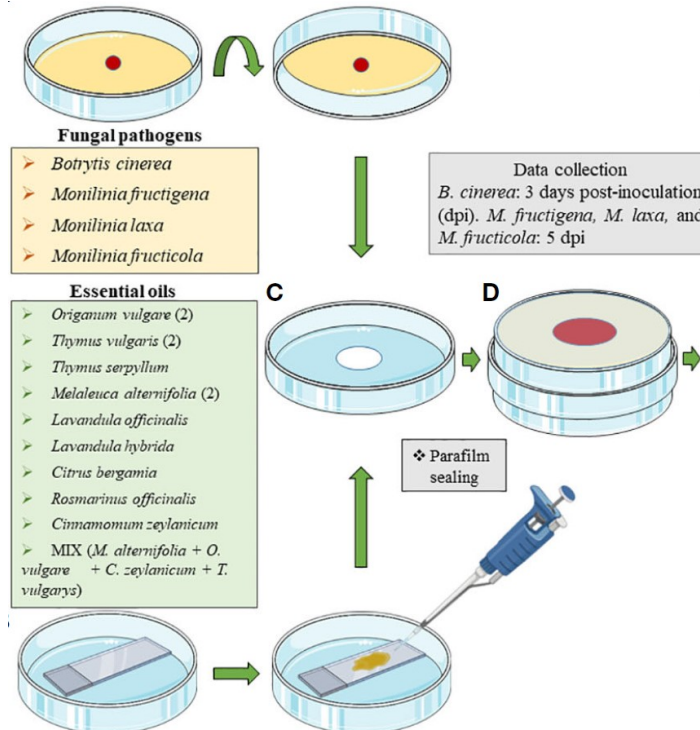
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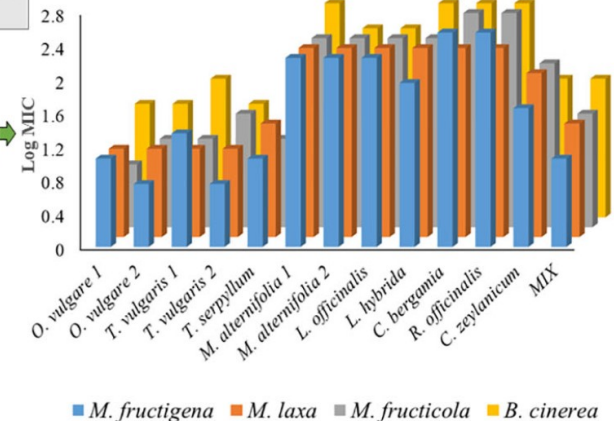
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Monilinia fructigena, and *Monilinia laxa*.
Front. Plant Sci. 14:1274770.

Potenziali sostanze di base? Oli essenziali



Minimum inhibitory concentration (MIC) of essential oil volatiles



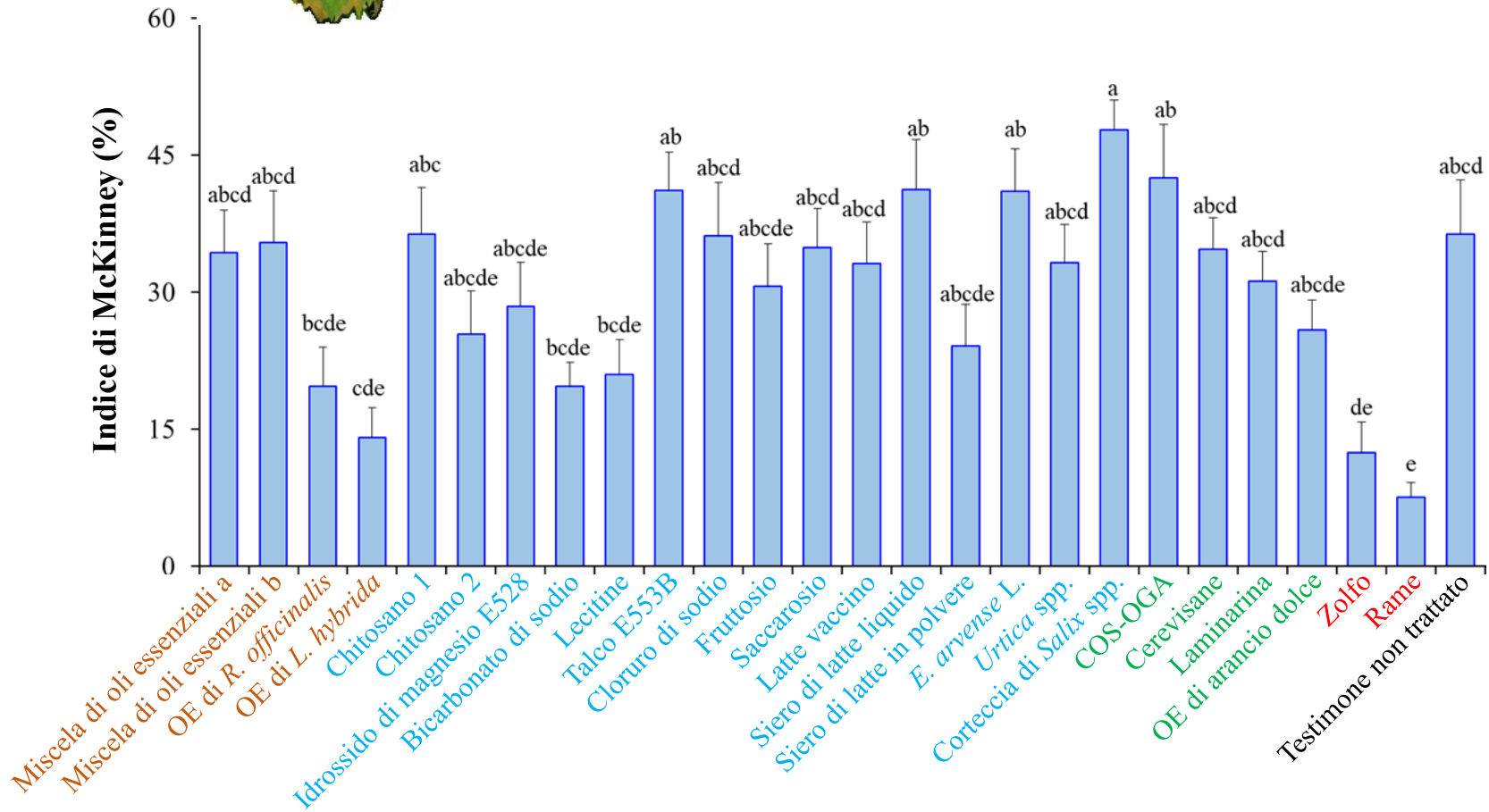
COMPOSTI SAGGIATI IN APPLICAZIONE SINGOLA

| Composti saggiati | Principio attivo (concentrazione) | Formulazione, azienda | Concentrazione/dose testata |
|-----------------------------|--|---|-----------------------------|
| Miscela di oli essenziali 1 | Miscela di oli essenziali (tuja, finocchio, lavanda ibrida, timo e citronella) | Oli essenziali puri, Le Sorgenti | 0.5% |
| Miscela di oli essenziali 2 | olio essenziale (OE) di <i>Rosmarinus officinalis</i> (100%) | Oli essenziali puri, SAO | 1% |
| OE di <i>R. officinalis</i> | olio essenziale di <i>Lavandula hybrida</i> (100%) | | 1% |
| OE di <i>L. hybrida</i> | Chitosano cloridrato (1.9%) | Chitosano, Biorend | |
| Chitosano 1 | Chitosano cloridrato (5%) | Chitosano, Serbios | 0,10% di sostanza attiva |
| Chitosano 2 | Chitosano cloridrato (5%) | Prevatect, Ascenza | |
| Chitosano 3 | Lecitina di soia (fosfolipidi) > 95% | Lecitina 80, Serbios | 4 L/1000 L |
| Lecitina di soia | <i>Equisetum arvense</i> (0.2%) | Equiset, Ascenza | 500 mL/hL |
| <i>E. arvense</i> | <i>Urtica</i> spp. (15%) | Valesco, Ascenza | 500 mL/hL |
| <i>Urtica</i> spp. | Idrossido di magnesio E528 (99,1%) | Magnesio idrossido E528, Farmalabor | 3,5 kg/8 hL |
| Idrossido di magnesio | Bicarbonato di sodio (>99,5%) | Bicarbonato di sodio purissimo, Solvay chimica | 2 kg/hL |
| Bicarbonato di sodio | Talco E553B (>85%) | Talco micronizzato E553b, Farmalabor | 8,5 kg/3 hL |
| Talco E553B | Cloruro di sodio (>99,5%) | Sale fino alimentare, Italkali | 2 kg/hL |
| Cloruro di sodio | Fruttosio (>99,5%) | Levulosio orale, Farmalabor | 10 g/hL |
| Fruttosio | Saccarosio (>99,5%) | Saccarosio semolato, Farmalabor | 10 g/hL |
| Saccarosio | Latte vaccino (13% s.s.) | Latte intero UHT, TreValli | 40 L/hL |
| Latte vaccino | Siero (7% s.s.) | Siero liquido fresco, caseificio locale | 10% (0,7% s.s.) |
| Siero liquido | Siero (90% s.s.) | Siero di latte in polvere per zootecnia, GreenVet | 10% (0,7% s.s.) |
| Siero di latte in polvere | <i>Salix alba</i> (>99,5%) | Chips per infusione, Fontana | 222,22 g/hL |
| <i>Salix</i> spp. cortex | COS (chito-oligosaccaridi) - OGA (oligo-galatturonidi) 12.5 g/L | Ibisco, Gowan Italia | 3 L/1000 L |
| COS-OGA | Cerevisiane (94,1%) | Romeo, Sumitomo Chemical Italia | 0,25 g/hL |
| Cerevisiane | Laminarina (45g/L) | Vacciplant, UPL Italia | 2 L/1000 L |
| Laminarina | Olio essenziale di arancio dolce (60 g/L) | Prev-Am, Oro Agri | 600 mL/hL |
| OE di arancio dolce | Zolfo (80%) | Tiovit jet, Syngenta Italia | 500 g/hL |
| Zolfo | Ossicloruro 20% + idrossido 10% di rame | Airone Extra, Gowan Italia | 125 g/hL |
| Rame | | | |

Infezioni peronosporiche su foglie cv. Montepulciano



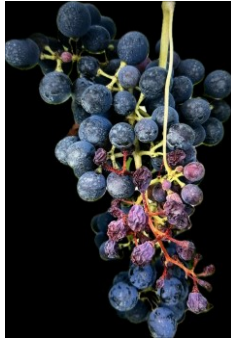
Rilievo del 7 luglio 2025, BBCH79
Dopo 7 applicazioni



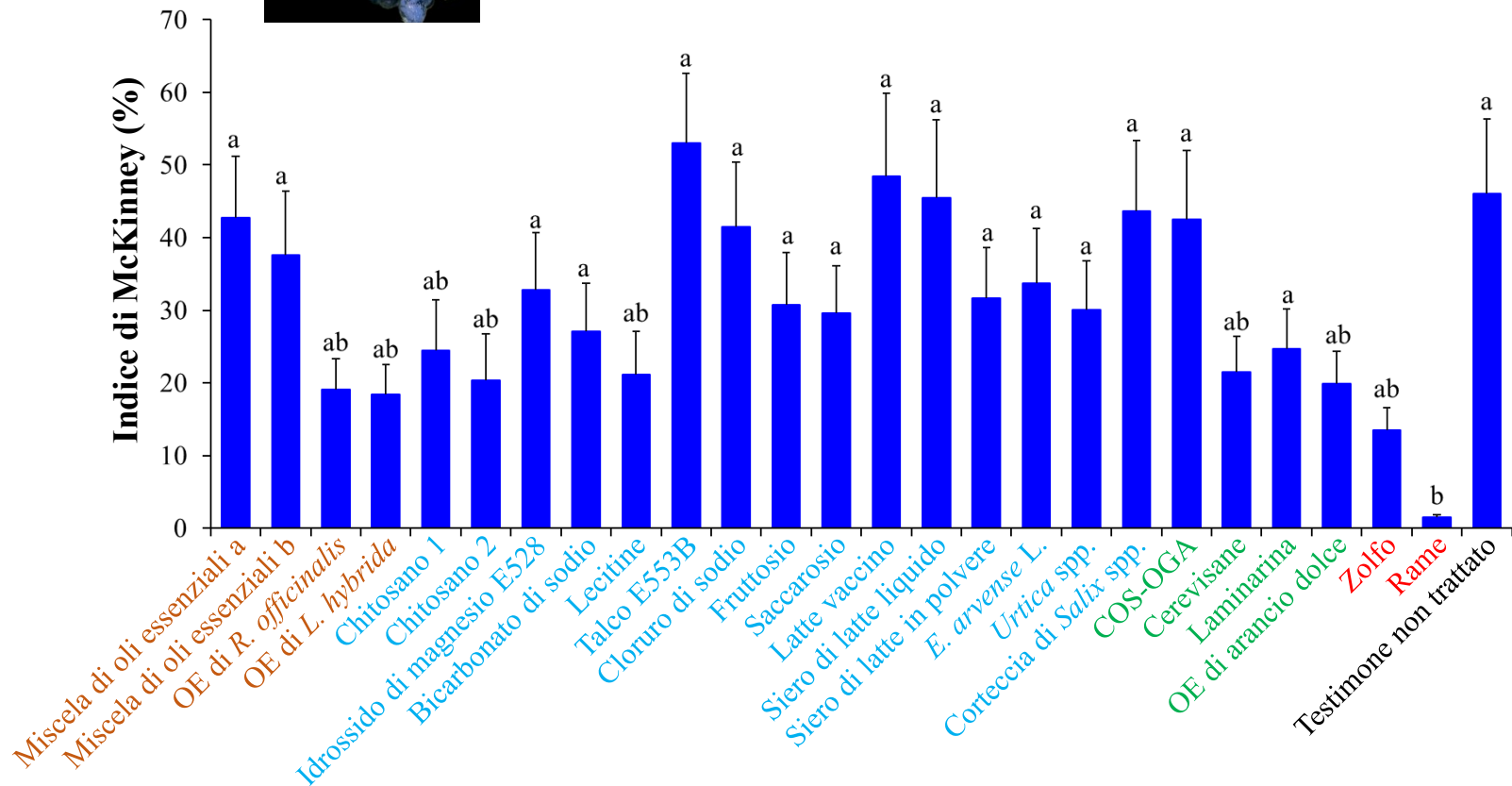
OE: olio essenziale

Tesi di laurea magistrale in SAT, dott. Ramazzotti Paolo

Infezioni peronosporiche su grappoli cv. Montepulciano



Rilievo del 7 agosto 2025, BBCH83
dopo 10 applicazioni



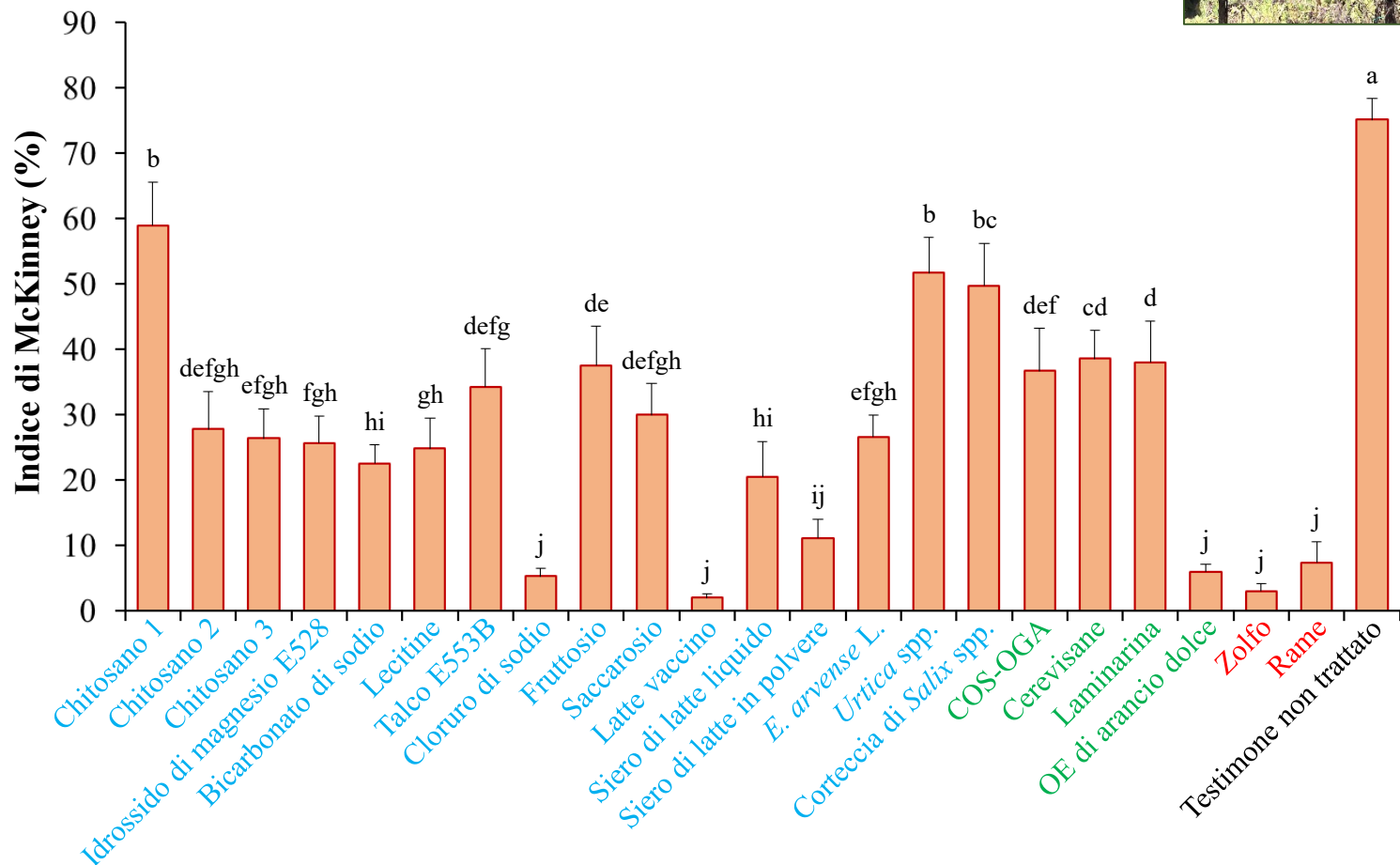
OE: olio essenziale

Tesi di laurea magistrale in SAT, dott. Ramazzotti Paolo

Infezioni oidiche su foglie cv. Montepulciano

Rilievo del 23 settembre 2024, BBCH89

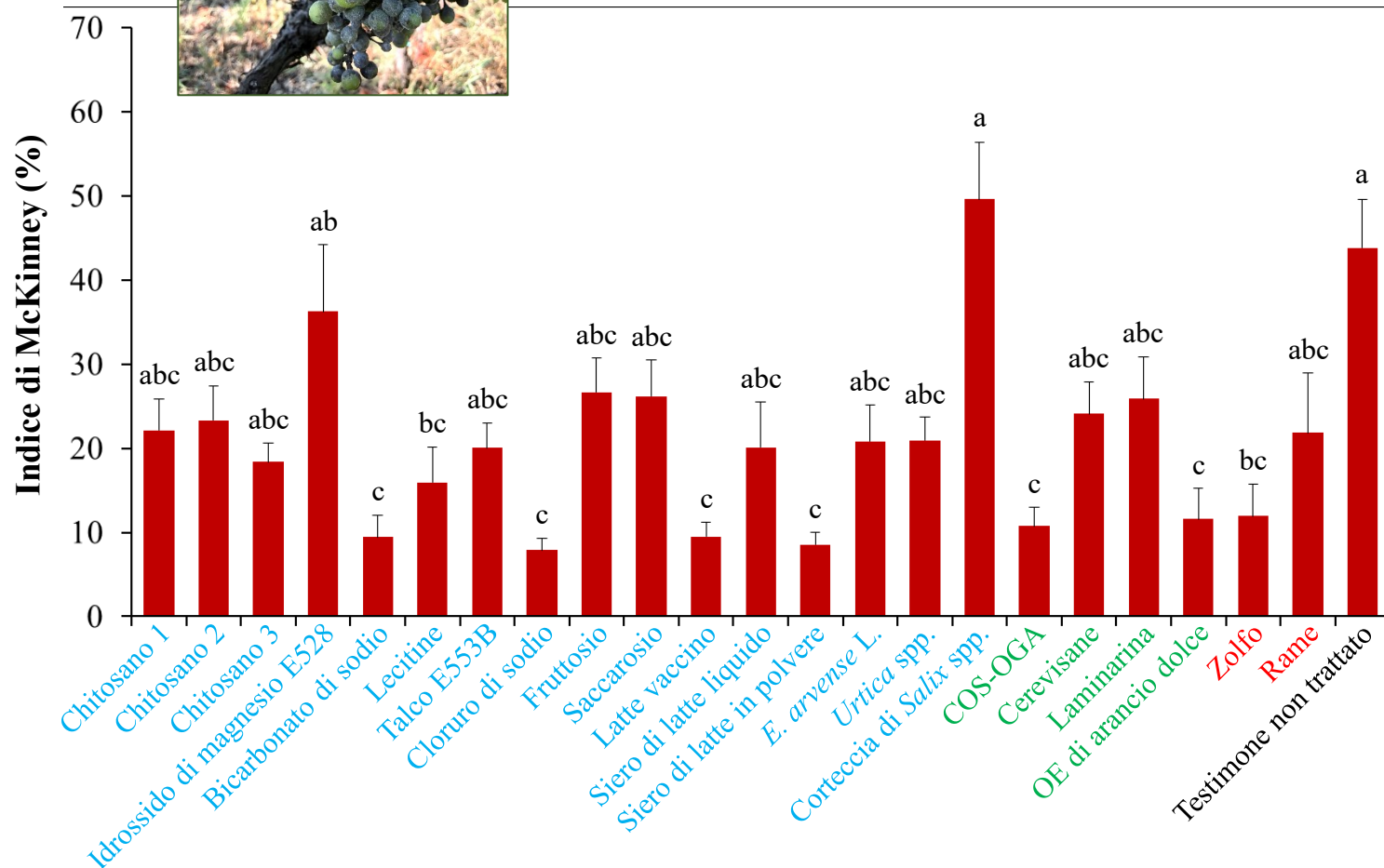
49 dopo l'ultima applicazione



Infezioni oidiche su grappoli cv. Montepulciano



Rilievo del 9 luglio 2024, **BBCH77**
dopo **8 applicazioni**



Sintomi di fitotossicità



Bicarbonato di sodio:
necrosi marginali



Cloruro di sodio:
bruciature marginali



OE di arancio dolce:
necrosi puntiformi



Latte vaccino: patina nerastra

OE: olio essenziale



Review

Are Basic Substances a Key to Sustainable Pest and Disease Management in Agriculture? An Open Field Perspective
































Silvia Laura Toffolatti ^{1,*} , Yann Davillerd ² , Ilaria D'Isita ³ , Chiara Facchinelli ⁴ ,
 Giacinto Salvatore Germinara ³ , Antonio Ippolito ⁵ , Youssef Khamis ⁶ , Jolanta Kowalska ⁷ ,
 Giuliana Maddalena ¹ , Patrice Marchand ² , Demetrio Marcianò ¹ , Kata Mihály ⁸ , Annamaria Mincuzzi ⁴ ,
 Nicola Mori ⁴ , Simone Piancatelli ⁹ , Erzsébet Sándor ⁸  and Gianfranco Romanazzi ⁹ 

Table 1. List of the basic substances which effectively protected the crops described in the present study from specific diseases.

| Crop (Species) | Disease (Pathogen) | Basic Substance | Reference |
|--|---|---|------------|
| Grapevine (<i>Vitis vinifera</i>) | Downy mildew (<i>Plasmopara viticola</i>) | Chitosan | [42,43] |
| | Botrytis bunch rot (<i>Botrytis cinerea</i>) | Chitosan | [66] |
| Potato (<i>Solanum tuberosum</i>) | Early blight (<i>Alternaria alternata</i>) | Nettle slurry (<i>Urtica dioica</i>) and broad-leaf hopbush (<i>Dodonaea viscosa</i>) methanolic extracts | [86] |
| | Early blight (<i>Alternaria solani</i>) | Water solutions of <i>Allium cepa</i> | [87] |
| | Late blight (<i>Phytophthora infestans</i>) | Chitosan | [78–80,82] |
| Strawberry (<i>Fragaria x ananassa</i> and <i>Fragaria chiloensis</i>) | Grey mold (<i>Botrytis cinerea</i>) | Chitosan | [90,95–97] |
| Sweet cherry (<i>Prunus avium</i>) | Storage decay | Chitosan | [98] |
| | Botrytis rot (<i>B. cinerea</i>) | Sodium bicarbonate salts | [108] |
| Date palm fruit (<i>Phoenix dactylifera</i>) | Storage decay | Chitosan | [99] |
| | Soft rot (<i>Botryosphaeria dothidea</i> and <i>Phomopsis</i> sp.) | Chitosan | [100] |
| Apricot (<i>Prunus armeniaca</i>) | Decay (<i>A. alternata</i>) | Chitosan | [101,102] |
| Peach (<i>Prunus persica</i>) | Decay (<i>A. alternata</i>) | Chitosan | [103,104] |
| Jujube (<i>Zizyphus jujuba</i>) | Storage decay | Chitosan | [105] |
| Tomato (<i>Solanum lycopersicum</i>) | Storage decay | Chitosan | [106] |
| Pear (<i>Pyrus communis</i>) | Storage decay | Onion (<i>Allium cepa</i>) extract | [109] |

Review

Are Basic Substances a Key to Sustainable Pest and Disease Management in Agriculture? An Open Field Perspective

Silvia Laura Toffolatti ^{1,*} , Yann Davillerd ², Ilaria D’Isita ³ , Chiara Facchinelli ⁴,
 Giacinto Salvatore Germinara ³ , Antonio Ippolito ⁵ , Youssef Khamis ⁶ , Jolanta Kowalska ⁷ ,
 Giuliana Maddalena ¹ , Patrice Marchand ² , Demetrio Marcianò ¹ , Kata Mihály ⁸, Annamaria Mincuzzi ⁴ ,
 Nicola Mori ⁴ , Simone Piancatelli ⁹ , Erzsébet Sándor ⁸  and Gianfranco Romanazzi ⁹ 

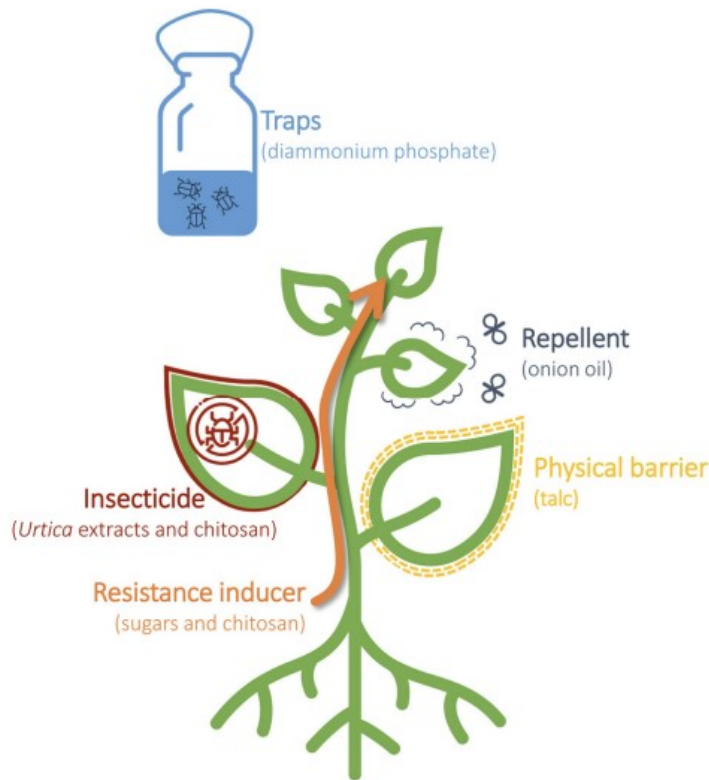


Figure 2. Utilization of basic substances in the management of plant pests. Basic substances can be used as insecticides, resistance inducers, physical barriers, repellents, and traps to control and manage plant pests.



Review

Basic Substances and Potential Basic Substances: Key Compounds for a Sustainable Management of Seedborne Pathogens

Laura Orzali ^{1,*}, Mohamed Bechir Allagui ², Clemencia Chaves-Lopez ³, Junior Bernardo Molina-Hernandez ³, Marwa Moumni ⁴, Monica Mezzalama ⁵ and Gianfranco Romanazzi ^{4,*}

Table 3. In vivo and in- field activities of potential basic substances applied as seed treatments to control seedborne fungi and oomycetes in different crops. Effectiveness is reported as the disease incidence or symptoms percentage reduction compared to the untreated control. Phytotoxicity was evaluated through germination testing and the results are compared to the untreated control.

| Potential Basic Substances—Fungi and Oomycetes | | | | | | | |
|--|--|--|-----------------------|--|---|---|-----------|
| Crop | Target Disease/Pathogen | Substance (Concentration) | Application | Effectiveness (Disease/Symptoms Reduction) | Possible Phytotoxicity | Activity/Defense Response | Reference |
| Durum wheat (<i>Triticum durum</i>) | Common bunt/ <i>Tilletia laevis</i> ³ | <i>Syzygium aromaticum</i> EO (0.3% v/v) | Immersion for 10 min | From 30% to 90% | Seed germination reduction | Reduction in pathogen incidence | [47] |
| | | <i>S. aromaticum</i> formulation (2.5% v/v) | | From 40% to 100% | Rate of seed germination equal to the control | | |
| | | <i>S. aromaticum</i> EO (1% v/v) | Coating | From 30% to 82% | Rate of seed germination equal to the control | | |
| | | <i>S. aromaticum</i> formulation (5% v/v) | Coating | From 30% to 85% | Rate of seed germination equal to the control | | |
| Wheat (<i>Triticum aestivum</i>) | <i>Fusarium equiseti</i> ² ; <i>F. culmorum</i> ² ; <i>F. poae</i> ² ; <i>F. avenaceum</i> ² | <i>S. aromaticum</i> EO 5 × 10 ³ ppm | Immersion for 8 min | 100% | Total inhibition of seed germination | Inhibition of pathogen development | [46] |
| | <i>Alternaria</i> spp. <i>Fusarium</i> spp. <i>Drechslera</i> spp. | <i>Origanum vulgare</i> , <i>Thymus vulgaris</i> and <i>Coriandrum sativum</i> Eos | Vapour | 50% | Inhibition of seed germination at 0.4% (thyme and oregano EO) | Inhibition of deoxynivalenol (DON) occurrence | [50] |
| | <i>Aspergillus</i> spp. <i>Fusarium</i> spp. ^{1,2} | Ozone (60 mg L ⁻¹) | Ozonation for 300 min | 54.3% | – | | [51] |

Elenco delle sostanze di base approvate, non approvate e in valutazione



| Approved | | | Finalized | | | Ongoing | | | | | | | |
|---|--|--|--|--|--------------------|--------------------|---------------------------------|---------------------------------------|-----------------------------|-----------------------------------|---------------------------------|----------------------------------|----|
| BS | Extensions | Withdrawal | BS | Non-admissible | Extension | Approval | Non-approval | Stop-clock | Pending with EFSA outcome | Admissible, under EFSA evaluation | Application | Extension | |
| Allium cepa bulb extract | Allium cepa L. bulb extract (Rev.2) | vinegar ext. (RR rev.2) | Citrus pulp | Achillea millefolium L. | sesame oil | Clayed charcoal | sodium chloride ext. Rev. 4 | Willow bark and stem extract | Ozone | Chitosan ext. (RR. rev.) | Pepper dust Piper nigrum | Sunflower oil ext. | |
| Allium fistulosum transformed | Allium fistulosum processed RR | vinegar ext. (RR rev.3) | Rhododendron honey | Arctium lappa L. (aerial parts) | CaOH2 | | Sodium hypochlorite | Yucca Schidigera extract (withdrawal) | CaOH2 ext. | sodium chloride ext. Rev. 6 Bra | Psidium guajava L. leaf extract | Equisetum arv ext. | |
| Beer | Beer (rev.1) | Chitosan HCl ext. (RR. rev.3) | Gastoneo and Schinopsis sp. Tannins | Artemisia absinthium L. | Potassium stearate | Sunflower oil ext. | Quassia amara wood (Itab/IFOAM) | sodium chloride ext. Ludwigia / | sodium chloride ext. Rev. 7 | chitosan HCl | | | |
| CaOH ₂ | Calcium hydroxide (rev. 2) | Equisetum arv ext. (RR rev. 6) | Valerian extract | Artemisia vulgaris L. | | | | | | | Moringa oleifera | Salix cortex ext. | |
| Chitosan | Chitosan (Rev. 4) | Equisetum arv ext. (RR rev. 7) | Extract from Rhododendron | Black soap E470a | | | | | | | Ocimum gratissimum extract | Urtica sp. ext. | |
| Chitosan HCl | Chitosan HCl ext. (RR rev.4) | Fructose ext. (RR rev.3) | Hop CO2 extract | Caffeine | | | | | | | | Urtica sp. ext. | |
| Clayed charcoal | Clayed charcoal (rev. 3.0) | Whey ext. Viticulture (RR rev. 2) | Potassium metabisulfite | Calcium propionate | | | | | | | | | |
| | | | | | | | IUCLID | IUCLID | IUCLID | IUCLID | IUCLID | IUCLID | |
| Cow milk | Milk (rev.3) | Sucrose ext. (RR rev.3) | Chabazite | Capsicum annuum L. var. annuum, longum group, cayenne, extract (Oleoresins capsicum) | | | | | | | Plantago major | vinegar ext. (FR) | |
| Diammonium phosphate | diammonium phosphate (rev. 3) | Lectithins ext. (RR rev.2) | Dodecylmethylammonium chloride (DDAC) | Carbon dioxide | | | | | | Capsicum oleoresin | Ethyl formate | sodium chloride ext. Rev. 5 APRR | |
| Equisetum arvense | Equisetum arv ext. (RR rev. 4) | lectithins ext. (RR rev. 4) | Organic polyphenolic botanical compost | Comfrey steeping | | | | | | | Ginger extr. | chitosan | |
| Fructose | Fructose ext. (RR rev.3) | sodium chloride ext. Baccharis a. (RR rev.2) | | Dimethyl Sulfide | | | | | | | Plectranthus amboinicus extract | chitosan hydrochloride | |
| Vitis vinifera L. seed extract (grape seed extract) | Vitis vinifera L. seed extract (RR rev.3) | Sodium bicarbonate ext. (RR rev.3) | Manihot esculenta Crantz | Eggshell powder | | | | | | | Camellia o seed extract | talc | |
| Hydrogen peroxide | Hydrogen peroxide (rev. 1) | Sodium bicarbonate ext. (RR rev.4) | H2O2 silver stabilized | Grape (Vitis vinifera) cane tannins | | | | | | | Water | Lectithins ext. | |
| L-cysteine | L-cysteine RR rev.4 | Chitosan HCl ext. (RR rev.6) | Quassia amara (ITAB) | Landes pine tar | | | | | | | Potassium sorbate | | |
| Lectithins | Lectithins ext. (RR rev.3) | vinegar ext. Chitosan (RR rev.6) | | Lemon essential oil | | | | | | | Schinopsis lorentzii extract | | |
| Magnesium hydroxide | Magnesium hydroxide E528 (RR rev.2) | Chitosan HCl ext. (RR rev.5) | | Origanum vulgare L. essential oil | | | | | | | Fenugreek seed powder | Equisetum arv ext. | |
| Mustard seed powder | Mustard seeds powder (RR Rev. 2) | Sodium chloride ext. (Flammopara (RR. rev.3) | | Paprika extract (capsanthin, capsonubin E 160 c) | | | | | | | | | |
| Onobrychis vicifolia (Sainfoin) dried pellets | Onobrychis vicifolia (sainfoin) dried pellets (RR rev.2) | | | Potassium sorbate | | | | | | | | | |
| Onion oil | Onion oil (rev.1) | | | Propolis (Water soluble extract) | | | | | | | | | |
| Salix cortex | Salix cortex (rev. 4) | | | Rheum officinale root extract | | | | | | | | | |
| Sodium bicarbonate | Sodium bicarbonate ext. (RR rev.4) | | | Sopronaria officinalis L. roots | | | | | | | | | |
| sodium chloride | Sodium chloride ext. (Flammopara (RR. rev.3) | | | Satureja montana L. essential oil | | | | | | | | | |
| Sucrose | Sucrose ext. (RR rev.3) | | | Tanacetum vulgare L. | | | | | | | | | |
| Sunflower oil | Sunflower oil (RR rev.4) | | | | | | | | | | | | |
| Talc E553b | Talc E553b (rev.4) | | | | | | | | | | | | |
| Urtica sp. | Urtica spp. (rev. 0.1) | | | | | | | | | | | | |
| Vinegar | vinegar ext. Chitosan (RR rev.6) | | | | | | | | | | | | |
| Whey | Whey ext. Viticulture (RR rev. 2) | | | | | | | | | | | | |
| 28 | 17 | 13 | 23 | 2 | 3 | | 3 | 3 | 4 | 6 | 0 | 13 | 12 |
| Positive BSA and extension= | 45 | Negative BSA = | 39 | | | | date : | | | June 1st 2025 | | | |

The preparation you are referring to is known as **Preparation 504** in biodynamic practices. This involves placing yarrow (*Achillea millefolium*) in the bladder of a male deer and then burying it in the soil.

Preparation 504 (Yarrow in Male Deer Bladder)

Materials Needed:

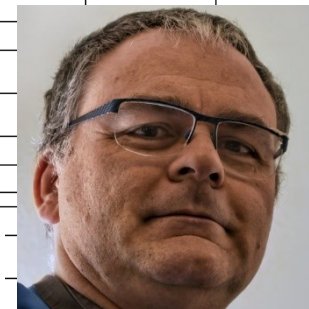
- Fresh yarrow (*Achillea millefolium*)
- Male deer bladder
- A location for burial in the soil

Instructions:

- 1. Fill the Bladder:** Take the bladder of a male deer and fill it with fresh yarrow. Make sure to pack it well.
- 2. Bury the Bladder:** Bury the filled bladder in the soil, typically during the winter months, for about 6 months to allow it to ferment and transform.
- 3. Unbury and Use:** After the appropriate time, unearth the bladder. The contents will have transformed into a biodynamic preparation.
- 4. Preparation for Use:** Once unburied, the preparation can be diluted and applied to enhance plant health and soil fertility.



Dr. Patrice Marchand (ITAB)





CA22134 - Sustainable Network for agrofood loss and waste prevention, management, quantification and valorisation (FoodWaStop)

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Description

Management Committee

Main Contacts and Leadership

Working Groups and Membership

Description

Food loss and waste (FLW) is a global challenge recognised by international governments and organisations. Reducing FLW is key to sustainably ensure nutritional food security for an increasing world population. It is a target of the Sustainable Development Goals of the United Nations, and the Farm to Fork Strategy of the European Green Deal. The FoodWaStop COST project addresses these challenges and aims to: (i) build an interdisciplinary and multi-actor European Network that will also connect with non-EU Mediterranean countries, to promote knowledge on FLW beyond the state of the art; (ii) determine incidence of FLW in the critical points of the fruit and vegetable value chain; (iii) foster technological innovations and sustainable management strategies to reduce and prevent FLW; and (iv) valorise agrofood waste to promote a circular bio-economy. The experience of the Coordinators and Participants gained from other related projects (e.g., PRIMA, H2020), the background from diverse EU and extra-EU countries, and the involvement of stakeholders and industry partners will contribute to increase awareness of this problem, to determine its incidence, to seek strategies for its management through exploitation of the potential of innovative technologies, and to define good practices to prevent FLW. The FoodWaStop Network will provide benefits to various stakeholders and end-users, including all actors in the agrofood value chain, from farmers (Farm) to consumers (Fork). Moreover, FoodWaStop will create a knowledge platform that will promote innovation, deliver guidelines, and favour dialogue with policymakers, to focus their attention on the social and economic implications of FLW.

Action keywords

Agrofood waste - Euro-Mediterranean knowledge hub - Sustainable food management - Circular bio-economy - Socio economic empowerment of smallholders

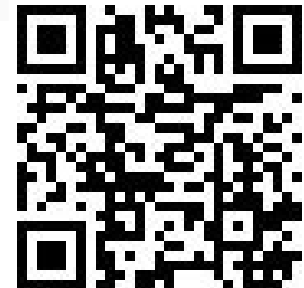
Action Details

- MoU - 044/23
- CSO Approval date - 12/05/2023
- Start date - 21/09/2023
- End date - 20/09/2027

How can I participate?

- Read the Project Description [MoU](#)
- Inform the Main Proposer/Chair of your interest ([email](#))
- [Apply](#) to join your Working Groups of interest
- Please note, Management Committee nominations are carried out through the [COST National Contact Points](#)

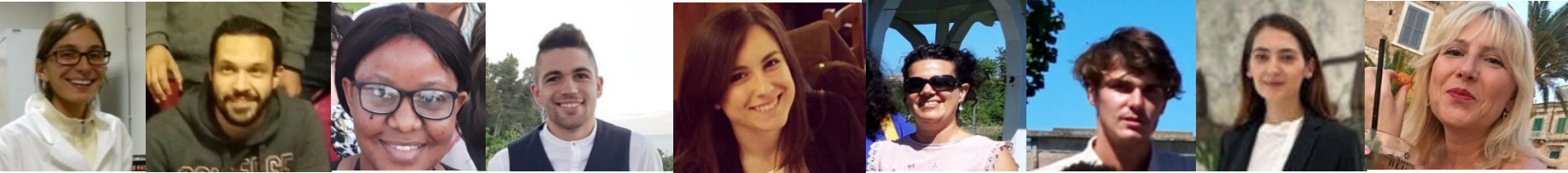
**856 WG members
from 61 Countries**



Considerazioni

Strategie di protezione basate sull'uso di sostanze di base e altre alternative a basso impatto ambientale, registrate per l'uso, possono contribuire alla sostenibilità e al miglioramento della qualità delle produzioni





*Grazie ai
collegi che
hanno
contribuito alle
sperimentazioni
e ai progetti
PNRR e
ValorBio che
hanno
supportato le
indagini*

Grazie per
l'attenzione

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