

Use of microorganisms activating the grapevine defenses towards Flavescence dorée attack: cooperation to improve competitiveness and sustainability of organic farms"

Riferimenti

Tipo di progetto

Gruppo Operativo

Acronimo

MIDIFENDO

Tematica

Agricoltura biologica

Information

Time frame

2019 - 2022

Durata

36 months

Partners (no.)

7

Regione

Veneto

Comparto

Viticultura

Localizzazione

ITH34 - Treviso

Costo totale

€352.900,00

Fonte di finanziamento principale

Programma di sviluppo rurale

Programma di sviluppo rurale

2014IT06RDRP014: Italy - Rural Development

Programme (Regional) - Veneto

Parole chiave

Pest /disease control

Farming practice

Sito web

<http://www.midifendo.eu>

Project status

completed



Objectives

The collaboration aim is to join together the partner skills to develop a preventive, sustainable and effective defense method against Flavescence dorée (FD), which supports the current strategies.

Activities

The activities will include the testing of different MVOCs, the identification of the best compounds among them, which will be selected by effectiveness, price, biodegradability; at the same time the microorganisms able to produce selected MVOCs will be identified.

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Partenariato

Role	Azienda	Address	Telephone	E-mail
Leader	Azienda Agricola Lucchetti Stiz Di Stiz Gianpaolo	Via Veneto, 42/a 31020 S. Poetro di Feletto TV Italy	320 9546609	gianpaolo.stiz@gmail.com
Partner	Azienda Agricola Pederiva di Martignano Annalisa	Via Veneto, 42/A 31020 San Pietro di Feletto TV Italy	338 8558524	annalisa.martignano@libero.it
Partner	Azienda Agricola La Cantina Pizzolato srl	Via IV Novembre, 12 31020 Villorba TV Italy	0422 928166	welcome@lacantinapizzolato.com
Partner	CREA - Centro ricerca Viticoltura ed Enologia	Viale Santa Margherita 80 52100 Arezzo AR Italy	0575353021	vic@crea.gov.it
Partner	Agridinamica s.r.l.	Via XXVI Aprile 13 36055 Nove VI Italy	0424 400953	info@agridinamica.com
Partner	Università degli Studi di Verona	Via S. Francesco, 22 37129 Verona VR Italy	045 802 8588	
Partner	Consorzio Tutela del Vino Conegliano Valdobbiadene Prosecco Superiore	Piazza Libertà 7 31050 Solighetto di Pieve di Soligo TV Italy	0438 83028	amministrazione@prosecco.it

Pratiche abstract

Description

Coordination with Payments Agency and the Veneto Region, sending of administrative and financial reports (months 1-36)
Intermediate objective: to guarantee the communication with the financier and a correct administrative and financial coordination

Results: correct financial and administrative reports, timesheets, invoices, financial and scientific reports

Description

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Coordination among the partners (months 1-36)

Intermediate objective: to guarantee the communication among the partners

Result: signature of ATI/ATS, names of the Managing Committee, 4 meetings with respective minutes, common site online Relationships among the partners will be regulated in detail by the regulations of the ATI/ATS, which will be signed during the first month of the project. Partners will be coordinated by Soc Agricola Semplice Ai Boz by means of the Managing Committee, formed by one person per partner, which will be individuated during the first meeting.

Description

Monitoring of activities (months 3-34)

Intermediate objective: to guarantee a correct development of the activities

Results: activities carried out and finished before the deadline

Soc Agricola Semplice Ai Boz, supported by CREA for the technical part and Agridinamica SRL for the administrative part, will ensure the development of the activities according to the work plan. During the meetings Soc Agricola Semplice Ai Boz, will describe the commitments of each partner for the next year and will send periodic mails close to the deadlines. Technical and managing problems will be communicated by the partners to Soc Agricola Semplice Ai Boz, who will face it and solve it together with the Managing Committee, readdressing the activities towards a new way if necessary. Everything will be in agreement with the ATI/ATS rules.

Description

Preparation and update of a dedicated Web site and of a Facebook account (months 3-34)

Intermediate objective: to have a Web site and a Facebook account dedicated to the project

Result: Web site and Facebook account, logo

Consorzio del Prosecco will suggest a logo, that will be adopted for every internal or external communication of the project. Moreover, it will create an online Web site, towards which every Web site of the partners will have its own link. The Web site will be regularly updated with the results and the ventures of the PAGO: conferences, articles, classes, on field demonstrations and so on. The project will be included in the PEI's sector at European level, according to the modalities established by the RDP and Veneto Region.

Consorzio del Prosecco will create a Facebook account for the project and it will periodically update it with the news and the ventures of the PAGO, in order to facilitate the spreading of the project itself and of its results on the social media.

Description

Preparation and writing of the Communication Plan (months 3-8)

Intermediate objective: to plan and to organize the communication and divulgation activities

Result: Communication Plan

Inside Consorzio del Prosecco will be nominated a Communication Manager. At the beginning of the project it will write a Communication Plan, which will be integrated by the other partners. This document will have in it the communication plan and the divulgation modalities of the project, as well as the monitoring modalities of these same activities. A minimum number of publications to be written in specialistic and non-specialistic, scientific, technical and generic magazines will be established. It will be decided upon how many congresses and scientific, technical or exhibition events, a contribution from the partners regarding the contents of the project will be brought. Target groups and wine-sector stakeholders will be individuated, as principal beneficiaries of communication and divulgation activities.

Description

Divulgation campaign (months 3-34)

Intermediate objective: to divulgate the project through different means individuated in the Plan

Result: Reports with all the relations brought to conferences and exhibitions, published articles, demonstrative tours in the vineyards; records of the thematic conference.

The problems and the project's results will be divulgated:

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- during the technical meetings for the wine-sector workers which will be periodically organized by Consorzio del Prosecco and CREA, as one of their activities.
 - during scientific conferences of the sector, national and international, curated by CREA and University of Verona partners
 - on national and international scientific magazines, curated by CREA and University of Verona partners
 - through the organization, at the end of the project, of a dedicated conference, in which all the done activities and the results of the project will be reported
 - through brief technical statement, informative leaflets and didactic material curated by University of Verona and spread to the associate, according to already individuated and in-used communicative channels (magazine, mails and so on)
 - through brief and simpler articles destined to the non-specialized press.
- Among the first and principal beneficiaries of the divulgation activities, principally companies, leaders in the wine-sector, will be selected, in order to act as a pulling for the other companies on the territory.

Description

Bibliography (months 3-5) partner CREA

Intermediate objective: to individuate microbial volatile

organic compounds which activate the jasmonate pathway, according to bibliography

Result: list of microbial volatile organic compounds which activate jasmonate pathways, according to bibliography

In this first phase a deep bibliographical reconnaissance will be realized on the most recent studies regarding the activities of some microbial volatile organic compounds on the activation of the defense pathways, with a particular attention on jasmonate pathway, which appears to be related to the answer of the grapevine to grapevine flavescence dorée. So, 3-4 potentially effective and valid for the purpose of this project microbial volatile organic compounds will be selected.

Description

Assessment of the minimal and maximal dose (months 5-16)

Intermediate objective: to individuate the most efficient dose of selected microbial volatile organic compounds that can stimulate jasmonate pathways

Result: best minimal/maximal dose

The 3-4 selected from bibliography microbial volatile organic compounds will be tested with 3-4 doses each, according to what is reported in bibliography. An experimental test with healthy graftlings, raised in vase under controlled conditions will be set up. The treatment with the chosen microbial volatile organic compounds will be carried out through leaf application with liquid solution. Before and after the treatment, leaf samples will be picked for every graftling and they will be stored in freezer or immediately processed, for the genic and metabolomic analysis respectively.

Transcriptomic analysis will be accomplished by CREA, through a total RNA extraction and a reverse transcription, followed by specific real time PCRs in order to underline the genic expression levels of genes associated with defense pathways.

With the metabolomic analysis, the following parameters will be analyzed will help us to understand 1) the most activating microbial volatile organic compound; 2) the most efficient dose; 3) the major persistence of the metabolites.

Description

Assessment of the effect against the vector (months 17-28)

Intermediate objective: to individuate possible microbial volatile organic compounds negative effects on the insect vector

Result: mortality index due to microbial volatile organic compounds

In CREA's structures an experimental test with grown in vase graftling will be set up. Microbial volatile organic compounds will be applied individually or in a mix of two or more microbial volatile organic compounds. *Scaphoideus titanus* specimens will be raised in CREA's structures: they will be born from two-years-old grapevine shoots collected in very infested vineyards and kept on graftling until the time to be tested.

Alternatively, insects will be collected in infested vineyards which don't have the disease. Around 20 healthy specimens of the insect vector will be put inside each cage, and they will derive from the breeding or the collection, as before described. Cages will be controlled every 24 hours and the possible died insects will be collected and counted.

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Description

Assessment of the efficient against grapevine flavescence dorée (months 17-28)

Intermediate objective: to individuate the percentage of graftlings which, after treatment, are infected by the phytoplasma and its concentration.

Result: efficacy index of microbial volatile organic compounds against grapevine flavescence dorée

A new and wider experimental test on graftlings will be set up, in which the different thesis will be treated with microbial volatile organic compounds that were more efficient to activate jasmonate pathway in the previous experiment. *S. titanus* specimens will be collected a month earlier in a vineyard. Before the leaves fall, around the end of September, visual observations for grapevine flavescence dorée symptoms' presence will be done and leaf samples of the different thesis will be picked, stored in freezer and analysed by CREA through qualitative and quantitative molecular analysis, with the purpose to underline the health condition of the plant and the concentration of the phytoplasma eventually present in them.

Description

Assessment of the microbial volatile organic compounds effects on plants (months 17-34)

Intermediate objective: to individuate microbial volatile organic compounds effects on jasmonic acid's pathway activation, on the production of interesting metabolites, on plants' growth and on their persistence, environmental biodegradability and possible toxicity.

Result: plants' growth index and metabolite's production due to microbial volatile organic compounds

Will be chosen from every thesis of the previous experimental test and they will be compared to healthy graftlings. All the graftlings will be monitored, starting from the budding and for the following two years, through visual evaluations and growing and health status parameters will be measured. Moreover, transcriptomic and metabolomic analysis will be carried out, in order to verify jasmonate pathway activation and compare them with those of water-treated graftlings.

With the metabolomic analysis, the following different parameters

Description

bibliography (months 3-5)

Intermediate objective: to individuate in bibliography microorganisms who can produce microbial volatile organic compounds

Result: microorganisms' list.

Basing on bibliography, a list of microorganisms who can produce Microbical volatile organic compounds will be written, giving a priority to the more complete scientific documentation in terms of the test of production of these chemical compounds at specific growth conditions of the microorganism. Interesting strains will be those available from the purchase in public and private collections. Interesting strains' number for the experimentation will be around 10.

Description

Evaluation of microbial volatile organic compounds production from selected microorganisms (months 6-17)

Intermediate objective: to individuate microorganisms who are microbial volatile organic compounds best producers.

Result: producer microorganisms' strains of chosen microbial volatile organic compounds.

Chosen strains will be grown on an optimal substrate for every specie and then they will be analyzed for microbial volatile organic compounds production. Growth on a common-for-every-strain substrate will be analyzed (it's supposed they belong to different species and genus).

Description

Evaluation of microorganisms' growth compatibility on a suitable substrate in order to use them for the plant treatment (months 18-34)

Intermediate objective: to individuate a solution with microorganisms for plant treatment.

Result suitable solution

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Suitable solution's composition for plant treatment, which will have microorganisms in it, will had to be studied. This solution will have to guarantee cells survival at high concentration and, mostly, the ability to stick to plant tissues, particularly to the leaves, reducing slide events due to gravity and washout. Cells' survival ability after plant treatment will be verified.

Description

evaluation of economic loss caused by grapevine flavescence dorée

Intermediate objective: to quantify economic damage due to productive loss and due to management costs of companies with organic and integrated management.

Result: companies' economic data, accounting reports.

Collection of historic data of partners companies as well as of representative companies. Economic loss due to grapevine flavescence dorée of the last 5 years will be estimated.

Used parameters will be those of market or cost value, while estimate procedure used will be the rational-analytic and parametric procedures.

Description

Evaluation of productive costs of the product (months 18-34)

Intermediate objective: to quantify production cost of a possible product made of selected microorganisms.

Result: production's cost of the product.

Costs of materials essential to large range production will be analyzed, as well as labor cost, used technology cost and the cost of possible patents.

Link utili

Titolo/Descrizione	Url	Tipologia
Sito web del progetto	http://www.midifendo.eu	Sito web
Pagina Facebook del progetto	https://www.facebook.com/progettomidifendo/	Link ad altri siti che ospitano informazioni del progetto
ARTICOLO - Al via il progetto mi.di.fen.do.	https://www.prosecco.it/it/flavescenza-dorata/	Link ad altri siti che ospitano informazioni del progetto
Video del progetto	https://consent.youtube.com/m?continue=https%3A/www.youtube.com/watch%3Fv%3Dsm...	Materiali utili
#CREABREAK per #innovazione2020: il progetto #MIDIFENDO di #ViticolturaEnologia	https://www.youtube.com/watch?v=sm6QBnSt4	Materiali utili

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