

Smart technologies for the monitoring, prevention and early diagnosis of olive economic diseases

Riferimenti

Tipo di progetto

Gruppo Operativo

Acronimo

SPREMO

Tematica

Difesa da malattie e infestazioni

Information

Time frame

2020 - 2023

Durata

35 months

Partners (no.)

11

Regione

Sicilia

Comparto

Olivicoltura

Localizzazione

ITG11 - Trapani

ITG14 - Agrigento

Costo totale

€499.998,48

Fonte di finanziamento principale

Programma di sviluppo rurale

Programma di sviluppo rurale

2014IT06RDRP021: Italy - Rural Development

Programme (Regional) - Sicilia

Parole chiave

Pest /disease control

Farming practice

Food quality / processing and nutrition

Sito web

<http://www.spremolivo.it>

Project status

ongoing



SPREMO

Objectives

Monitoring network to prevent the emergence of fungal diseases, bacteria and viruses in Sicilian olive orchards through the implementation of smart technologies. The project aims, in particular, to counter the spread of newly introduced diseases such as the bacterium *Xylella fastidiosa*. The project also plans to introduce changes in the process and organization in the field and in the mill to improve the economic and environmental sustainability of olive-growing companies and the quality of certified quality olive production (DOP, IGP, EFSA Claims).

Activities

Introduction of phytosanitary protocols for evaluation of olive propagation material and the early diagnosis of diseases of economic interest based on LAMP technology. Creation of a monitoring network of the main olive diseases through the use of a mobile application. Drafting of a specification of good agricultural practices, for biological and / or conventional systems, for the prevention of the main olive tree diseases and emerging ones (*Xylella fastidiosa*). Introduction of new protocols to obtain extra virgin olive oils batches with specific and homogeneous chemical attributes.

Context

Predicting olive tree biotic stress early means being able to intervene effectively when the damage to the plant's organs is not evident with advantages on the quality of the oils and the productivity of the plants. The development of innovative methods that allow the early diagnosis of stress in plants of agricultural interest and a more rapid and efficient intervention in their management is certainly an essential objective to allow Sicilian olive growing to be competitive internationally. In the olive tree, there is a lack of "smart" technological applications for the defense against biotic adversities.

and this despite the negative implications determined by an empirical implementation of agronomic defense plans on the environment, healthiness and quantity of production. The introduction in the production processes of innovative "user friendly" methods that allow the early diagnosis of abiotic and biotic stresses in olive trees and of IoT decision support systems is therefore a valid tool to reduce product losses and improve the commercial and healthy quality of the oils. These are, therefore, topics related to the themes of technological innovation useful not only for the purpose of improving business performance but also for a sustainable use of natural resources in agriculture, food safety and, overall, the quality of life.

Partenariato

Role	Azienda	Address	Telephone	E-mail
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Applicazione di tecnologie “smart” per il monitoraggio, prevenzione e diagnosi precoce delle malattie di interesse economico dell’olivo

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<https://www.innovarurale.it/pei-agri/gruppi-operativi/bancadati-go-pei/applicazione-di-tecnologie-smart-il-monitoraggio>

Role	Azienda	Address	Telephone	E-mail
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Partner	SOCIETA' AGRICOLA TORREDARA S.S.	Via dei Gladioli n. 3 92019 Sciacca AG Italy		agr.amodeomario@gmail.com
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Pratiche abstract

Description

Introduction of a tool for the early diagnosis of Xylella based on the isothermal amplification technique LAMP (Loop mediated isothermal AMPlification). It is estimated that this technique is about 100 times more sensitive than end point PCR and does not require highly qualified personnel. For this reason it is particularly useful and suitable for use in the field in order to diagnose the possible presence of destructive diseases in an early form. The project involves the distribution to partner companies of the equipment, diagnostic protocols and test kits, developed by the researchers involved in this project, with the aim of working independently and possibly diagnosing the presence of pathogens at an early stage. of great interest as prescribed by the reference protocols of the European Union through its body the European and Mediterranean Plant Protection Organization (EPPO).

Description

Decision support Implementation through IoT systems. The system consists of a mobile application and sensors located in the field capable of collecting sensitive data to help the farmer in calculating intervention times and timeliness in dealing with various adversities. The system was designed according to the principles of sustainable agriculture and has the task of remotely guiding the company manager throughout the production cycle in order to minimize product losses and minimize the use of pesticides. The mobile app called GO-Olive, already developed by the researchers involved in the project, will be adapted to the needs of the agricultural entrepreneur and nurseryman. The App consists of several windows that can be consulted either by scrolling or by reading key. Each disease will contain extensive photographic documentation (you already have photos), the description of the pathogen, the methods for diagnosing it and any therapies to be adopted.

Description

Introduction of a tool capable of evaluating the commercial quality (acidity number of peroxides, UV spectro-photometric analysis) and health (polyphenols, acidic composition and alpha tocopherol) of extra virgin olive oils. It is a tool based on NIR (Near Infrared Reflectance) non-destructive predictive technology that can provide quantitative results on the quality of oils in a few minutes and that can be used by anyone. The instrument has already been calibrated by the researchers involved in the project for the analysis of Sicilian monovarietal oils for the main qualitative parameters such as: acidity, peroxides, K232, K270, Delta K, alkyl esters, polyphenol waxes, erythrodiol and fatty acid profile.

As part of the project, this tool will allow you to quickly analyze the oils obtained in the oil mill, partner of the project, and in relation to the results of the analysis, they will be stored separately to obtain high quality oils (EFSA health claims) and standardized over the years"

Description

Water management of plants according to "precision" farming methods. The water state of plants, in addition to influencing their growth, has repercussions on the quality of the oils obtained, above all on the phenolic composition and on the volatile fraction of olive oils. In order to evaluate the possibility of reducing irrigation inputs, it is essential to determine the plant water status (PWS), commonly measured through the use of the pressure chamber designed by Scholander (1965). Recently, Zimmerman et al (2008) developed a sensor (ZIM-probe) capable of measuring the turgor pressure of the leaves, one of the components of the water potential that is able to give us direct and continuous information on the water state of the plant. The ZIM probes have already been tested on some varieties of forest species as well as on grapevine, grapefruit, banana and olive trees. For the latter species, using ZIM sensors, the research group involved in the project has developed the methodology for determining the water stress thresholds of plants for irrigation purposes. Among the main advantages of this "precision" management of the water resource, there is not only the possibility of achieving significant savings in terms of water use, both economic and environmental.

Link utili

Titolo/Descrizione	Url	Tipologia
Sito web del progetto	http://www.spremolivo.it	Sito web
