BeeOShield: an innovative biomolecular defence against bee parasites

Riferimenti
Tipo di progetto
Gruppo Operativo

Acronimo
BeeOShield

Tematica
Difesa da malattie e infestazioni

Information
Time frame
2019 - 2023

Durata
48 months

Partners (no.)
7

Regione
Veneto

Comparto
Apicoltura

Localizzazione
ITH34 - Treviso

Costo totale
€348.091,34

Fonte di finanziamento principale
Programma di sviluppo rurale

Programma di sviluppo rurale
2014IT06RDRP014: Italy - Rural Development Programme (Regional) - Veneto

Parole chiave
Animal husbandry and welfare
Farming/forestry competitiveness and diversification
Pest /disease control
Biodiversity and nature management
Farming practice

Sito web
https://www.beeoshield.org/

Project status
completed

Objectives
The BeeOShield project aims to demonstrate for the first time in Europe, the effectiveness of dsRNAs in contrasting the major bee parasites. Thanks to this project, we aim to achieve a natural balance of the colonies and to safeguard bees with a method compatible with times, standards and production techniques of beekeeping companies. The expected benefits for the farms are three: i) improvement of the health status of bees with attention to increased productivity of honey and related products ii) greater productivity of crops that need bees for pollination iii) safeguarding of biodiversity.

Activities
The project activities are divided into four main categories:

1) Management and coordination of the operating group (GO) BeeOShield;

2) Experimental activities, field tests and laboratory analysis;

3) Dissemination activities;

4) Training activities.

The core of the project are the experimental activities of the pilot project aimed at testing the effectiveness in the field of particular biomolecules (dsRNA) in countering the main bee parasites.

Context
The bees, together with the other pollinators, through the pollination of flowers, carry out fundamental and free ecosystem and agricultural services, without which there would be no agriculture, and in particular the cultivation of entomophilous plants (whose pollination takes place by insects). In recent years, in some Member States, the number of colonies

has even decreased by more than 50% (C.E. data). Autumn and winter losses contribute to the weakening of the colonies and the decline in honey production, which can even reach 50% in some Member States, and even 100% in certain regions. The increase in bee mortality forces beekeepers to buy new colonies more regularly, which leads to increased production costs. Since 2002 the cost of a colony is at least quadrupled and the replacement of a colony of bees often causes a drop in production in the short and medium term, since the new colonies are less productive in the initial phase. The increase in mortality of honey bees and wild pollinators currently observed in Europe is worrying, taking into account its negative repercussions on agriculture, biodiversity and ecosystems. This increase in mortality is caused by multiple stress factors, which vary according to the geographical area, local characteristics and climatic conditions. These factors include the severe impact of invasive species such as the Varroa destructor mite, as well as pathogens such as Nosema spp. and of viruses (including the deformed wing virus, DWV) that still cause numerous cases of health problems and losses during the active season until winter.

Partenariato

Role	Azienda	Address	Telephone	E-mail
Leader	Smart bugs s.s.	Via Cave, 66 31020 Villorba TV Italy	042 2969352	info.smartbugs@gmail.com
Partner	Università degli studi di Padova - Dipartimento di Biologia	Via U. Bassi, 58/B 35131 Padova PD Italy	049 8276178	direzione.biologia@unipd.it
Partner	Istituto Zooprofilattico Sperimentale delle Venezie	Viale dell'Università 10 35020 Legano PD Italy	049 8830380	comunicazione@izsvenezie.it
Partner	APAT- Apicoltori in Veneto	Via E. Porcù, 13 31040 Nervesa TV Italy	0422 771281	faiveneto@federapi.biz
Partner	Impresa Verde Treviso e Belluno srl	Via Sante Biasuzzi 20 31023 Paese TV Italy	0422954111	treviso@coldiretti.it

Role	Azienda	Address	Telephone	E-mail
Partner	Apicoltura Marcon	Via Lavaio, 69 31040 Volpago del Montello TV Italy	0423 870055	info@apicolturamarcon.it
Partner	Apicoltura Vallazza	Via Pian 1 32020 Colle Santa Lucia BL Italy	348 2293907	vallazza.ruggero@gmail.com

Pratice abstract

Description
The BeeOShield project aims to i) demonstrate for the first time in Europe the effectiveness and applicability of dsRNAs in the fight against the major bee parasites; ii) disseminate knowledge and awareness to citizens and professionals about the application in agriculture of this new therapeutic approach, totally organic and environmentally sustainable. The dsRNAs are small biological molecules that, by exploiting a molecular mechanism naturally present in all living cells, are able to "down-regulate" the target genes in a completely specific way and without making permanent changes to the genetic material. In this way, as recently demonstrated in laboratory tests, by administering specific dsRNAs to the bees, it is possible to i) block the replication of viruses, ii) block the replication of parasitic fungi such as Nosema spp., Iii) reduce the proliferation of ectoparasites such as Varroa destructor. With the BeeOShield project we want to demonstrate for the first time in Europe the effectiveness in the field of dsRNAs as a means of combating the main pests of the aforementioned bees and thus transfer the knowledge acquired from research directly to the field for the benefit of farms and more indirectly of all citizens.

Link utili

Titolo/Descrizione	Url	Tipologia
Sito del Progetto BeeOshield	http://www.beeoshield.org	Sito web
Project presentation, video	https://www.youtube.com/watch?v=oiednsiC3Bw&t=3496s	Link ad altri siti che ospitano informazioni del progetto
Project presentation, video	https://www.youtube.com/watch?v=9x1AnhhaVSs&t=239s	Link ad altri siti che ospitano informazioni del progetto

Titolo/Descrizione	Url	Tipologia
Project presentation, video	https://www.youtube.com/watch?v=CqQSjOhk2Fo	Link ad altri siti che ospitano informazioni del progetto
Project presentation, video	https://www.facebook.com/beeoshield/videos/583746552361697/	Link ad altri siti che ospitano informazioni del progetto
Facebook Page	https://www.facebook.com/beeoshield/	Link ad altri siti che ospitano informazioni del progetto
Youtube channel	https://www.youtube.com/channel/UCHorIzXy4zdTWGhUqsIZj_Q	Link ad altri siti che ospitano informazioni del progetto
Article	https://agronotizie.imagelinenetwork.com/zootecnia/2019/12/16/beeoshield-innova...	Link ad altri siti che ospitano informazioni del progetto
Article	https://ilbolive.unipd.it/it/event/uninnovativa-difesa-biomolecolare-contro-par...	Link ad altri siti che ospitano informazioni del progetto
Article	http://www.trevisotoday.it/green/gruppo-difesa-api-veneto-treviso-26-novembre-2...	Link ad altri siti che ospitano informazioni del progetto

Titolo/Descrizione	Url	Tipologia
Article	http://www.venetouno.it/notizia/55548/-salviamo-le-api-venete-	Link ad altri siti che ospitano informazioni del progetto