



Monitoraggio ambientale con le api



Sustainable Beekeeping, from the south of the world



BEENET: MONITORING BEE NETWORKS TO EVALUATE THE ITALIAN AGROECOSYSTEM

<u>Giovanni Cilia</u>, Sergio Albertazzi, Gherardo Bogo, Michela Boi, Vittorio Capano, Elena Cargnus, Valeria Caringi, Emanuele Carpana, Roberto Colombo, Francesca Corvucci, Amanda Dettori, Simone Flaminio, Manuela Giovanetti, Francesca Vittoria Grillenzoni, Irene Guerra, Giulia Lora, Piotr Medrzycki, Antonio Nanetti, Marino Quaranta, Giorgia Serra, Elena Tafi, Laura Zavatta, Laura Bortolotti CREA Research Centre for Agriculture and Environment, CREA-AA, Bologna, Italy

giovanni.cilia@crea.gov.it

The BeeNet project aim to evaluate the quality of the Italian agroecosystem through honey bees and wild bees

The monitoring started in 2021 and will end in 2024, for a total of 3 years

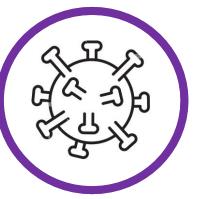
MONITORING HONEY BEE COLONIES

The monitoring involves all of the twenty Italian regions, using sedentary apiaries of 5 colonies

A network with 360 apiaries

SAMPLING

Colony strength monitored every season: March, June, September and November



PATHOGENS

Analyzed 4 times per year Sample: forager bees

DWV, ABPV, CBPV, KBV

Nosema cerane

Lotmaria passim

Crithidia mellificae and C. bombi



Analyzed 2 times per year (March and June)
Sample: bee bread

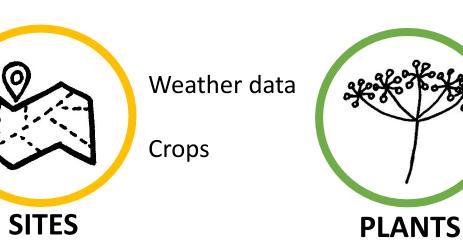
GC-MS/MS
UHPLC-MS/MS
UHPLC-HRMS

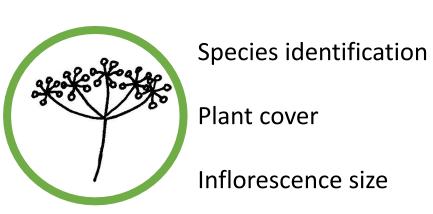
MONITORING WILD BEES

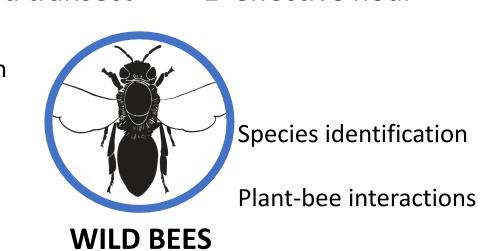
The <u>National Pollinator Monitoring Scheme</u> is carried out in 11 Italian regions, in which at least two sampling sites have been defined: one in an intensive agroecosystem (AI) and one in a semi-natural agroecosystem (ES) within a protected area.



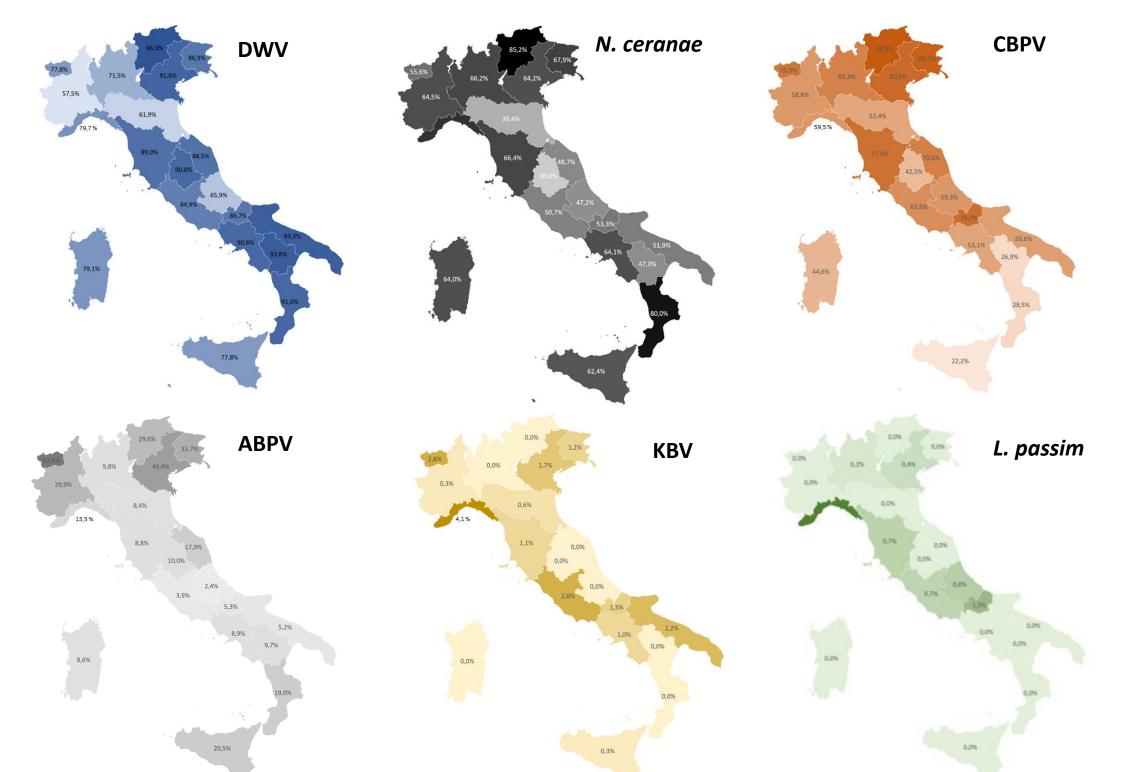
Monthly sampling from March to October — 200x2m fixed transect — 1 effective hour







RESULTS OF THE FIRST YEAR



The most prevalent pathogens from June 2021 to March 2022 were DWV (70.9%), *N. ceranae* (59.2%), CBPV (56.9%). *C. bombi* was not found in any of the regions.

Percentage and number of samples with a different number of active ingredients

225

30%

30%

162

200

150

200

150

200

150

200

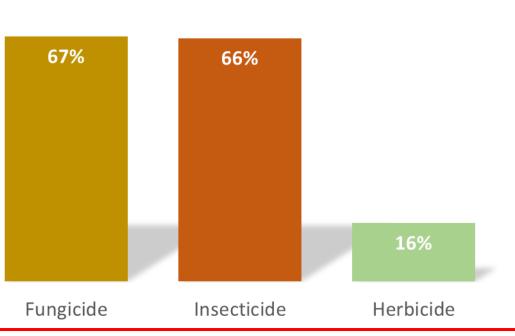
150

200

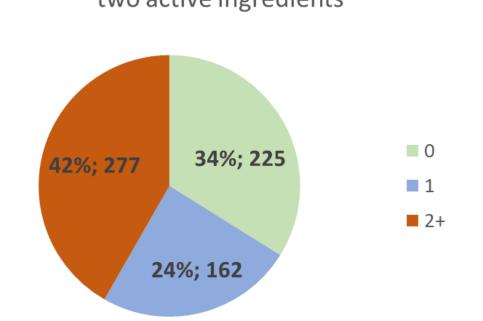
Active ingredients number

Active ingredients number

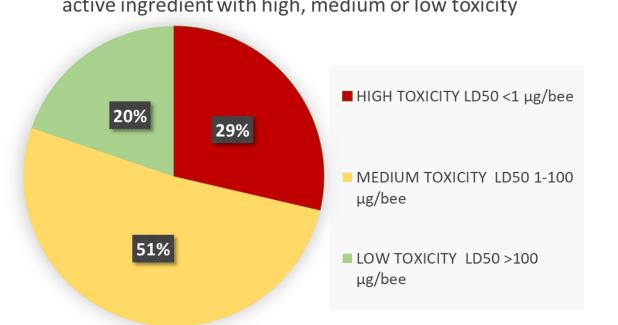
Percentage of samples containing at least one fungicide, insecticide or herbicide



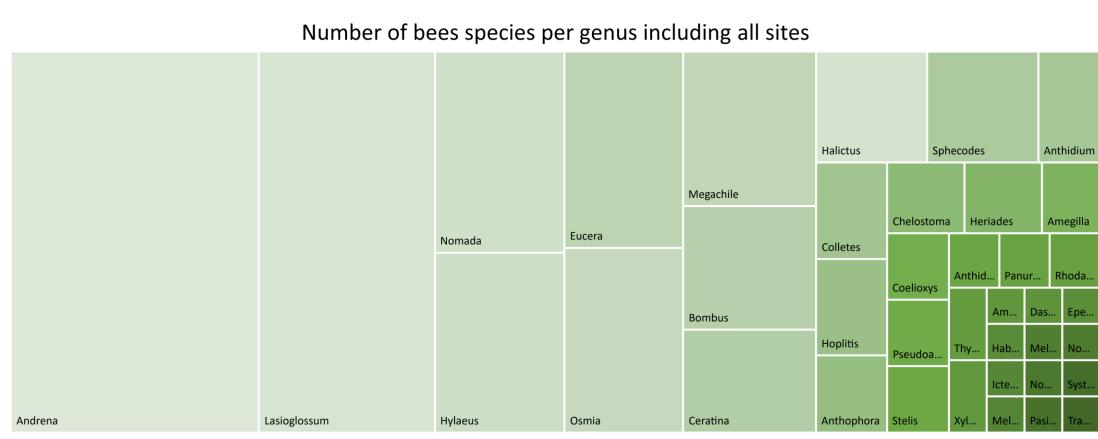
Percentage and number of samples without or with only one or more of two active ingredients



Percentage of positive samples containing at least one active ingredient with high, medium or low toxicity



RESULTS OF THE FIRST YEAR



4135 specimens captured. About 330 different species of wild bees.

Among these, the most represented genera are *Andrena* Fabricius, 1775 (69 spp.) and *Lasioglossum*Curtis, 1833 (49 spp.).

It is interesting to note the presence of kleptoparasitic genera among which the most represented are: *Nomada* Scopoli, 1770 and *Sphecodes* Latreille, 1804: data supporting greater ecosystem stability.



Sphecodes gibbus (Linnaeus, 1758)



Nomada sexfasciata Panzer, 1799



Coelioxys elongata Lepeletier, 1841



(Latreille, 1809)

Number of plants and bees species in each site

NORTH

CENTRAL ITALY

SOUTH

OF FRAIL FRES PIAI PIES VEAL VEES ERAL ERES UMAI UMES TOAL TOES ABAL ABES CAAL CAES PUAL PUES SIAL SIES SAAL SAES

In sp. Bee In n. sp. Plants



Oxalis pes-caprae L. alien and invasive species. Intensive agroecosystem in Puglia



Anacamptis papilionacea (L.)
R.M.Bateman, Pridgeon &
M.W.Chase LC (IUCN Red List
2011).
Semi-natural agroecosystem in

A well-planned monitoring plan allows the gathering of diverse information on honeybees and wild bees, that may reflect the status of the agricultural systems experienced by these important pollinators.

BeeNet 2019-2025 (Italian National Fund under FEASR 2014-2020 by the MASAF "Ministero dell'agricoltura, della sovranità alimentare e delle foreste" to the CREA "Consiglio per la Ricerca in agricoltura e l'analisi dell'economia agraria")



