

WOAH Collaborative Centre Reports Activities 2025

This report has been submitted: 2 mars 2026 23:39

CENTRE INFORMATION

*Title of WOA Collaborating Centre	Good Beekeeping Management Practices and Biosecurity Measures in Apiculture
*Address of WOA Collaborating Centre	Istituto Zooprofilattico Sperimentale delle Regioni Lazio e Toscana
*Tel:	+39 06.79.0991
*E-mail address:	giovanni.formato@izslt.it
Website:	www.izslt.it
*Name Director of Institute (Responsible Official):	Dr. Stefano Palomba
*Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):	Dr. Giovanni Formato (DVM, Head of IZSLT Lazio Nord), Head of the WOA Collaborating Centre
*Name of the writer:	Dr. Giovanni Formato

TOR 1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOA

Category	Title of activity	Scope
Training, capacity building (true)	Coordination of the Horizon Europe Project B-THENET Horizon Europe Project. Thematic Network on "BEST PRACTICES AND INNOVATIONS FOR A SUSTAINABLE BEEKEEPING" - Acronym: BTHENET	Horizon Europe Project. Thematic Network on "BEST PRACTICES AND INNOVATIONS FOR A SUSTAINABLE BEEKEEPING" - Acronym: BTHENET
Animal welfare (true)	National Research project IZS LT 08/22 RC	National Research project IZS LT RC 03/25: Prevention of biotic and abiotic stressors in bees from a One Health perspective. Assessment and management of bee welfare.
Diagnosis, biotechnology and laboratory (true)	Accreditation	The Istituto Zooprofilattico Sperimentale del Lazio e della Toscana has implemented the customer-oriented Quality Policy in compliance with the ISO 9000 and UNI CEI ISO/IEC 17025 standards. This is to grant qualified laboratory results and services, officially acknowledged by EU and by third countries. IZSLT is a multisites laboratory accredited in 1998 (SINAL n. 201 accreditation) according to the UNI CEI

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		EN 45001 directive, and now by Accredia (the Italian accreditation body) according to the UNI CEI ISO/IEC 17025 standard, "General requirements for the competence of testing and calibration laboratories"
Feed safety (true)	Partner in the National Research project IZS PLV 06/24 RC	Partner in the National Research project IZS PLV 06/24 RC. Title: "Investigation of the quality and safety of imported honey through multidisciplinary approaches"
Training, capacity building (true)	Partner in the Horizon Europe Project BETTER-B	Horizon Europe Project. Project name: Improving Bees' Resilience to Stressors by Restoring Harmony and Balance. Project acronym: BETTER-B. Call: HORIZON-CL6- 2022- BIODIV-02-two-stage. Partner activities during 2023: WP6 coordination, PCR development for SHB detection in bee hive debris, development of an on-line tool for beekeepers.
Environmental monitoring (true)	Regional project	Environmental monitoring with honey bee colonies in Viterbo province.
Training, capacity building (true)	Regional project	GENAPIS Project: Monitoring of <i>Vespa velutina</i> and <i>Vespa orientalis</i> in Latium Region
Diagnosis, biotechnology and laboratory (true)	Diagnostic activities in beekeeping	The following laboratory analysis according to WOAHA Manual of Diagnostic Tests and Vaccines for Terrestrial Animals have been performed: 171 <i>Varroa destructor</i> infestation level assessment 188 <i>Nosema</i> spp. microscopy 188 American foulbrood cultural method 64 European foulbrood cultural method 133 American foulbrood PCR end-point analyses 148 European foulbrood PCR end-point analyses 2619 <i>Aethina tumida</i> identification 2609 <i>Tropilaelaps</i> spp. identification 42 <i>Nosema apis</i> PCR end-point analyses 41 <i>Nosema ceranae</i> PCR end-point analyses 32 Inspections of affected samples 95 Morphometrical identification of <i>Apis</i> species 169 Deformed Wing Virus (Type A) PCR end-point analyses 154 Deformed Wing Virus (Type B) PCR end-point analyses 21 Israeli Acute Paralysis Virus PCR end-point analyses 21 Kashmir Bee Virus PCR end-point analyses 173 Chronic Bee Paralysis Virus PCR end-point analyses 20 Acute Bee Paralysis Virus PCR end-point analyses 169 Black Queen Cell Virus PCR end-point analyses 18 Sac Brood Virus PCR end-point analyses 13 <i>Apis mellifera ligustica</i> Ecotype 123 Analysis on honey and pollen (melissopalynological, palynological and humidity) 3000 Antibiotic susceptibility testing performed according to the current legislation, the relevant International Standards, and the protocols developed by the EURL-AR. Results are interpreted according to the Annex A of the Dec. 2020/1729/EU and to the "Manual for reporting 2021 antimicrobial resistance data within the framework of Directive 2003/99/EC and Decision 2020/1729/EU".
		The Collaborating Centre is successfully participating

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Training, capacity building (true)	Ring tests	to the following international ring tests: - melissopalinalogical analysis proposed by IHC (International Honey Commission); - royal jelly characterization proposed by IHC (International Honey Commission); - melissopalinalogical analysis proposed by BIPEA (https://www.bipea.org/); - honey humidity proposed by BIPEA (https://www.bipea.org/); - morphometrical analysis proposed by CREA-API (Bologna, Italy); - melissopalinalogical analysis proposed by CREA-API (Bologna, Italy); - Aethina tumida identification (adults and larvae) proposed by the Italian National Reference Laboratory for Apiculture (IZSve).
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TOR 3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable Area
PCR for <i>Tropilaelaps</i> spp. from hive debris	Development of PCR protocols for <i>Tropilaelaps</i> spp. from the selected regions of mitochondrial Cytochrome Oxidase I (COI) of the four <i>Tropilaelaps</i> species (<i>T. mercedesae</i> , <i>T. clareae</i> , <i>T. thaii</i> , <i>T. koenigerum</i>).	Laboratory Expertise

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOAHP?

No

4. Did your Collaborating Centre maintain a network with other WOAHP Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same speciality, to coordinate scientific and technical studies?

Yes

Name of WOAHP CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
Ministerio de Agricultura of Chile	Chile	América	Visit of Dr. Franco Gamboa González, DVM of the Departamento de Sanidad Animal, División de Protección Pecuaria of Servicio Agrícola y Ganadero of Ministerio de Agricultura of Chile

TOR 4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHP Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

Yes

Name of WOAHP CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
			Participation in the Varroa

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COLOSS	Bern	Africa Americas Asia and Pacific Europe Middle East	Control Task Force: to share expertise and perform field trials to develop monitoring and control methods. Participation to SHB Task Force: to compare methods for surveillance and control of <i>Aethina tumida</i> .
International Federation of beekeepers' associations (APIMONDIA)	Rome	Africa Americas Asia and Pacific Europe Middle East	Participation in the Scientific Commission "Bee Health"
European Professional Beekeepers Association	Lukovica (Slovenia)	Europe	Vice-president of the Bee Health Scientific Commission
Italian Agency for the Promotion of Scientific Research (APRE), Loba Customer Experience Design, Swedish University of Agricultural Sciences, Bee Life European Beekeeping Coordination, Danish Beekeepers Association, Slovenian Beekeepers' Association, Complutense University of Madrid, Hellenic Agricultural Organization DIMITRA, Faculty of Veterinary Medicine of University of Zagreb, Poland National Institute of Horticultural Research, University of Veterinary Medicine and Pharmacy in Košice, Honeybee Valley, Ghent University, State Institute of Bee Research University of Hohenheim, Latvia University of Life Sciences and Technologies, University of Graz, University of Veterinary Medicine in Budapest, Bern University	N.A.	Europe	B-THENET Thematic Network. Project coordination.
Istituto Zooprofilattico Sperimentale delle Venezie (National Reference Centre for beekeeping and the National Reference Laboratory for honey bee health)	Padova (Italy)	Europe	SHB ring test. Project: "Investigation of the quality and safety of imported honey from non-EU countries through multidisciplinary approaches". Project: "Development of an Integrated System for Monitoring and Prevention of

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			Varroa Resistance in Italy (V-ITA)."
Italian National Reference Centre of Animal Health	Brescia (Italy)	Europe	Honey Bee Welfare studies
Food and Agriculture Organization	Rome (Italy)	Africa Americas Asia and Pacific Europe Middle East	Recognition of Good Practices and Innovations in Sustainable Livestock Transformation, One Health, Animal Health and Reference Centers B-THENET - BEST PRACTICES AND INNOVATIONS FOR A SUSTAINABLE BEEKEEPING. Contribution to the organization of the World Bee Day (May 2025)
DEPARTMENT OF LIVESTOCK DEVELOPMENT – MINISTRY OF AGRICULTURE AND COOPERATIVES THAILAND	Bangkok (Thailand)	Asia and Pacific	MEMORANDUM OF UNDERSTANDING between DEPARTMENT OF LIVESTOCK DEVELOPMENT – MINISTRY OF AGRICULTURE AND COOPERATIVES THAILAND and ISTITUTO ZOOPROFILATTICO SPERIMENTALE DEL LAZIO E DELLA TOSCANA "Mariano Aleandri"
Veterinary Services of Viterbo (Italy)	Viterbo (Italy)	Europe	Environmental monitoring using the honey bees
IZS of Mezzogiorno	Naples (Italy)	Europe	Development of innovative diagnostic technologies to support field control activities of <i>Aethina tumida</i> (SHB) in Italy.
Dalan Animal Health, the U.S. biotechnology company developing vaccines for bees.	Athens, Georgia (U.S.A.)	Americas	Field protocol for testing the Dalan Vaccine in controlling major honeybee diseases
Centre for Research in Agriculture (CRA)	Rome (Italy)	Europe	Monitoring of <i>Vespa velutina</i> and <i>Vespa orientalis</i> in Italy. Project: StopVelutina.
Western College of Veterinary Medicine (WCVM), University of Saskatchewan	Saskatoon, Saskatchewan, Canada	Americas	Monitoring AMR in <i>Paenibacillus</i> larvae (AFB) strains isolated from Canada and Europe

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University of Pisa - Faculty of Veterinary Medicine	Pisa (Italy)	Europe	Training in the One Health II level Master. PhD Supervisor.
University of Tor Vergata - Faculty of Veterinary Medicine	Rome (Italy)	Europe	Training of Apiculture at the II year Veterinary Course
Instituto Nacional de Investigação Agrária e Veterinária (INIAV), Portugal	Avenida da República, Quinta do Marquês 2780-157 Oeiras, Lisbon Region (Portugal)	Europe	COST Action Participation in the Project: BeSafeBeeHoney, CA22105, supported by COST (European Cooperation in Science and Technology).
Food and Agriculture Organization - Oman	Muscat (Oman)	Asia and Pacific	Services related to Strengthening SME's capacities for sustainable and economic apiculture in the Sultanate of Oman
Food and Agriculture Organization -REU — Regional Office for Europe and Central Asia.	H-1146 Budapest, Stefánia út 101-103, Hungary	Asia and Pacific Europe	Contribution to set-up a guide on stamping out of honeybees due to diseases
Latium Region	Rome (Italy)	Europe	Set-up of the Regional Law in Beekeeping

TOR 6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOA?H?

No

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

No

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA?H, to personnel from WOA?H Members?

No

TOR 8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOA?H?

Yes

National/International	Title of event	Co-organiser	Date	Location	No. Participants
Nationally	"Environmental monitoring with honey bees from a One-Health perspective"	IZSLT	2025-02-20	Rome (Italy)	50

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Nationally	"Advances in Beekeeping"	Viterbo Veterinary Services & APITUSCIA Beekeeping Association	2025-03-01	Montefiascone, Viterbo Province, Italy	80
Nationally	Webinar: "Mandatory training for beekeepers according to the new EU Animal health Law"	IZSLT	2025-09-04	FAD	9500
Nationally	"Protection, conservation and improving of Apis mellifera ligustica in Latium Region: genetic and morphological characterization and good beekeeping practices"	IZSLT	2025-05-29	Rome (Italy)	50
Internationally	Global Bee Health: Tackling Emerging Diseases and Improving Sustainable Beekeeping	IZSLT, FAO, WOA, APIMONDIA	2025-05-16	Rome (Italy)	100

TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOA that may be useful to Members of WOA

a) Articles published in peer-reviewed journals:

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1. Di Ruggiero, C., Gyorffy, A., Artese, F., De Carolis, A., De Simone, A., Pietropaoli, M., ... & Formato, G. (2025). Environmental and Colony-Related Factors Linked to Small Hive Beetle (*Aethina tumida*) Infestation in *Apis mellifera*. *Agriculture*, 15(9), 962.
2. Mortellaro, C., Giannottu, E., Pedrelli, C., Lorenzi, V., Pietropaoli, M., Manara, V., ... & Formato, G. (2025). Categorisation of the One Welfare Practices in Beekeeping. *Animals*, 15(15), 2236.
3. Di Ruggiero, C., Gyorffy, A., Artese, F., De Carolis, A., De Simone, A., Pietropaoli, M., ... & Formato, G. (2025). The Mobile Divider Method: An Effective Strategy to Detect Small Hive Beetle (*Aethina tumida*) Adults in Honey Bee Colonies (*Apis mellifera*) in Calabria, Italy. *Applied Sciences*, 15(9), 4890.
4. Mosca, M., Gyorffy, A., Milto, M., Di Ruggiero, C., De Carolis, A., Pietropaoli, M., ... & Formato, G. (2025). Antibiotic Use in Beekeeping: Implications for Health and Environment from a One-Health Perspective. *Antibiotics*, 14(4), 359.
5. Ghisellini, P., Garbati, P., Pietropaoli, M., Cersini, A., Pietrella, G., Rando, C., ... & Eggenhöfner, R. (2025). A Novel Biosensor for the Early Detection of *Aethina tumida* via *Kodamaea ohmeri* in Honeybee Colonies. *Insects*, 16(4), 363.
6. Fernández-Alba, A. R., Murcia-Morales, M., Oller-Serrano, J. L., Martínez, J. A., Van der Steen, J. J., Brodschneider, R., Pietropaoli, M., ... & Danneels, E. (2025). Honey bee hives as biomonitors of pesticide environmental pollution. *The INSIGNIA-EU monitoring action. Science of the Total Environment*, 999, 180285.
7. Walczyńska, A., Braeckman, M., Capela, N., de Graaf, D. C., Dezmirean, D. S., Dupont, Y. L., Pietropaoli, M., ... & Ziótkowska, E. (2025). Reviewing published and grey literature in local European languages to supplement existing databases on floral resource traits. *Ecological Solutions and Evidence*, 6(3), e70065.
8. Palonen, Aura, et al. "Spatiotemporal variation of small hive beetle infestation levels in honeybee host colonies." *Apidologie* 56.5 (2025): 1-16.
9. Manara, V., Zacepins, A., Brodschneider, R., Tlak Gajger, I., Kasza, G., Meana Mañes, A., ... & Formato, G. (2025). First attempt to identify and prioritise best beekeeping practices with a multi-actor approach in the EU. *Journal of apicultural research*, 1-13.
10. Cornelissen, B., Formato, G., Federico, G., Cersini, A., van Gent-Pelzer, M., Hendriks, M., ... & Neumann, P. (2025). Detecting a Small Hive Beetle's eDNA in Honeybee Colonies. *Journal of Applied Entomology*. <https://doi.org/10.1111/jen.70034> - First published: 06 November 2025

b) International conferences:

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- 14/03/2025. Scientific Commission of European Beekeeping Association. Lukovica, Slovenia.
- 15/03/2025. "Modern methods of controlling varroa". *ApiSlovenija*, Celje, Slovenia.
- 16-17/09/2025 Workshop Animals as Bioindicators. COST Actions BeSafeBeeHoney and SafeGameMeat. Poland.
- 23-27/09/2025 "The EU project B-THENET and its support to sustainable beekeeping". 49th Apimondia Congress, Copenhagen (Denmark).

c) National conferences:

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- 09/01/2025. "Bee pathologies. The support of the analysis laboratory". Rome, Gruppo Api Sparse Beekeeping Association.
- 15/02/2025. "Varroa management, field trials and resistance". Como, APACL Beekeeping Association.
- 22/02/2025. Webinar "Honey Bee Diseases". Cooperativa Apicoltori Umbertide Beekeeping Association
- 29/10/2025 XV CONFERENCE OF THE REGIONAL BEEKEEPING CENTER: CARE. "Updates and news on the beekeeping sector". Turin.
- 20/12/2025 Annual Conference of SVETAP Association. Webinar.

d) Other (Provide website address or link to appropriate information):

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

Our activities have been oriented to promote globally and to adapt to the specific geographical context:

- *high standards of Good Beekeeping Practices (GBPs);*
- *high standards of Biosecurity Measures in Beekeeping (BMBs);*
- *proper measures to prevent and mitigate the impact of Antimicrobial Resistance (AMR);*
- *guidelines, training and checklists for risk assessment concerning bee health and welfare;*
- *new diagnostic procedures for veterinarians concerning honey bee diseases;*
- *guidelines for the biosecurity measures for Bumble bees.*

12. Additional comments regarding your report:

Delivered advanced teaching and training activities at the Faculty of Veterinary Medicine in Rome, contributing to capacity building of veterinarians on bee health, diseases, and One Health approaches.

Actively contributed to international knowledge exchange and best practices in sustainable beekeeping and honey bee disease prevention.

Received the FAO Global Award for B-thenet platform on best practices in beekeeping (good farming practices and biosecurity measures and innovations), recognizing excellence in innovation, networking, and global collaboration in the apiculture sector.

Supported evidence-based policies and technical guidance on bee health and AMR through scientific expertise and institutional collaboration.