



Appendix V

Annual Report (2021) Healthy
Hives LATAM / Salud Apicola



Final progress report

Salud Apícola Latinoamérica

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1. Summary

The "*Salud Apícola Latinomérica*" programme (Healthy Hives Latin America) has finished both monitoring and capacity building in four countries in Latin America. The different national cultures and practices allow for interesting interactions and the overall results show the importance of the implementation of Best Practices in beekeeping, none withstanding the cultural and climatic differences between the different countries.

In all four countries, the potential for the sector becomes apparent through the interaction with the beekeepers and the visits to the different territories. However, in each country, there are problems to overcome. There is, however, one main issue, which is the same in the four countries: implementation of public policies that allow the professional development of the sector permitting the production of high-quality raw materials (honey, pollen and propolis, among others) and professional pollination services. On a practical level there are many sanitary gaps are a result from the lack of the implementation of Best Practices.

Unfortunately, COVID-19 restricted the mobility of the team. Therefore, capacity building sessions in an online format were developed, to provide the beekeepers with the optimal amount of feedback based on the monitoring results. Scientific papers have been sent for evaluation, edited based on feedback from reviewers and are being written. The online networks have provided information to a broad range of stakeholders, and new materials have been developed for online use.

Based on the project's results, a new project started in Chile to establish a technological development roadmap for beekeepers in the O'Higgins Region. Different initiatives have been developed in Colombia using the *Salud Apícola* methodology and interest has been shown by countries like Paraguay.

In conclusion the project has contributed to various countries in Latin America with knowledge, capacity building, and broad diffusion via the different social media. All generated materials are available online, and available for future use and by new participants of the *Salud Apícola* Latin America network.

2. Mile stones final stage

1. Implementation of the 2nd bee health monitor in the fourth country

The health monitor was implemented in Costa Rica. Two monitors were taken forward, with 60 beekeepers monitored during the first and 31 during the second monitor, which was cut short due to the COVID outbreak. Nevertheless, it provides a representative sample of the beekeepers in the territory.

2. Publication of bee health monitor in the fourth country

The summary of the results can be found in the following link (Annex 1)

[Annex 1_Monitoring Costa Rica.pdf](#)

The presentation will be uploaded to the website once the scientific publication has been accepted.

3. Definition of capacity building methodology for the fourth country

The capacity building in Costa Rica, the fourth country, took place during the second semester of 2021. Because of the low COVID infections rates, the sessions were on-site. The capacity-building materials were adapted according to the specific Costa Rican conditions and distributed to the beekeepers.

The capacity building programme can be found in the following link:

[Annex 2_-Programa de Capacitación Costa Rica Noviembre 2021 .pdf](#)

A summary of the capacity building activities can be found in the following link:

[Annex 3_Informe capacitaciones Costa Rica.docx.pdf](#)

Two scientific papers

The following scientific papers were sent in for publication or published:

- Olate-Olave, V.R.; Verde, M.; Vallejos, L.; Perez Raymonda, L.; Cortese, M.C.; Doorn, M. Bee Health and Productivity in Apis mellifera, a Consequence of Multiple Factors. Vet. Sci. 2021, 8, 76. <https://doi.org/10.3390/vetsci8050076> (Accepted)
- Mayda Verde, Marnix Doorn*, Leslie Vallejos, Verónica R. Olate-Olave, y Jorge Demedio. Approach to the epidemiology of varroosis in central Chilean apiaries was emitted to the Chilean Journal of Agricultural & Animal Sciences.

The manuscript can be found in the following link:

[Annex4_Varroa en Chile_final.pdf](#)

- Rafael A. Calderón-Fallas, Rafael A. , Johan W. van Veen, Verónica R. Olate-Olave, Mayda Verde, Marnix Doorn, Leslie Vallejos, Juan Vicente Orozco-Delgado. Africanized honey bee colonies (*Apis mellifera scutellata*) in Costa Rica: management, brood nest structure and factors associated with varroa mites infestation and *Nosema* spp intensity,, al Journal of Apicultural Research (submission ID is: 216736979).

The manuscript was sent to the Journal of Apiculture Research at the beginning of December and can be found in the following link:

[Annex 5_Art Africanizedhoney beesinCostaRicasometidoTJAR-01dic 2021-0428.pdf](#)

4. Poster and/or oral presentation

- Presentación el congreso de apicultura en Peru, Noviembre 2021

[Annex 6_Desinfección Perú.pdf](#)

- A joint Bayer-Fraunhofer workshop was taken forward at SETAC – Latin America in October 2021 on general issues related to pollinators.

The manuscript can be found in the following link:

[Annex 7_Opening Session 1A - SETAC LATAM 2021 MA .pptx](#)

- During the second semester of 2020 an oral presentation was given at the 24th Conference of the ICABR "Accelerating Bioeconomy" – “Estrategia de bioeconomía para políticas públicas en la Apicultura: seguridad alimentaria y gestión sostenible del sector”

[Annex 8_BIOECONOMY&APICULTURE.pdf](#)

5. Newsletters (2)

Two newsletters were published, one in December 2020 and a second one in December 2021 at the end of the project. The Newsletters can be found under the following links:

<https://saludapicola.com/newsletter-diciembre-2020/>

https://saludapicola.com/wp-content/uploads/2021/12/211212_NEWSLETTER_2021_F.pdf?6bfec1&6bfec1

6. Online publication of capacity building material and monitoring methodology

All capacity-building materials are available online as well as the description of the monitoring methodology. The direct link to the Costa Rica materials is:

[Folletos CR](#)

The materials will be uploaded to the project website as well <https://saludapicola.com/guias-para-apicultores/>

7. Publication of monitoring results in four countries

A database of the results of four countries has been constructed to be able to make relevant comparisons between countries. This database is available under the following link

[Annex 9_BD LATAM.xlsx](#)

The final report will be published on the website once all scientific application have been accepted by the journals.

8. Implementation of capacity building in four countries

The capacity building in Costa Rica was taken forward on-site during November 2021. A report of the activities can be found under the following link:

[Annex 3 Informe capacitaciones Costa Rica.docx.pdf](#)

9. Publication of capacity building results in four countries

This only requires a summary of the capacity building sessions, lessons learned and materials.

The methodology of the capacity building can be found in the following link:

[Annex 10_Metodología Capacitaciones en 4 países.docx.pdf](#)

A summary of the activities can be found in the following link:

10. Online publications of results

The summary of the results in terms of number can be found in the following link [Annex 11 Resúmen números Salud apícola.docx.pdf](#)

11. One workshop in each participating country

During 2021 workshops took place in the context of Salud Apícola Latinoamérica in Chile during the APIUOH project of the O'Higgins University to formulate a regional roadmap for the development of the sector towards 2030. In Colombia, the results of the project were presented both to different actors in the Antioquia department as well as during a Corpohass seminar in Pereira in November 2021. In both Argentina and Costa Rica workshops were taken forward to present the monitoring results before the capacity building sessions.

12. Final report

A final report has been prepared that focusses on the model the project proposes. A general context is given, the methodology of the monitoring, a summary of the most important results (specifics are presented in the scientific papers). A theoretic framework is worked out, reviewing the Best Practices related to the main gaps identified. Finally, based on the theoretic framework the topics of the capacity building are presented.

The report can be found in the following link:
https://drive.google.com/open?id=1rUlo58TIB2o1TG7TpzpGYMYWGQs74IL7&authuser=marnix.doorn%40gmail.com&usp=drive_fs