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# Proceedings of COLOSS B-RAP core group workshop: 'Bridging research and beekeeping practice'

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Edited by:

Antonio Nanetti

Council for Agricultural Research and Economics, CREA-API - Honey bee and  
Silkworm Research Unit



Bologna, Italy, 22-23 March 2017

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## Topics

The workshop is intended to be the continuation of the work on the issues the B-RAP group has worked with in previous workshops. In Cluj-Napoca, the main issues were decided to be the following:

- 1) Questionnaire to analyse the structure of beekeeping training/education in all COLOSS countries.
- 2) Questionnaire targeting COLOSS members and other relevant persons. The aim is to "ask" how scientists and advisers put priority on dissemination: How often, how, and what needs for improving.
- 3) A guideline on how to evaluate the quality of websites with information on beekeeping. A very long and interesting discussion on this issue resulted in a slight change of the task, so we decided to produce a recommendation list with minimum requirements for websites.
- 4) We had an initial discussion about producing a questionnaire for a survey on how we can improve dissemination of information to the beekeepers. We will get help from the monitoring group to distribute this questionnaire.

During the workshop members will divide into smaller groups when adequate.

Participants are expected to make a short presentation of good dissemination examples from daily work.

A joint meeting with the Varroa taskforce is planned also, to discuss subjects of common interest.

## Organization contacts

The workshop will be held at:

[CREA-API](#) (Honey bee and Silkworm Research Unit of National Council for Agric. Research and Economics)

Via di Saliceto 80

40128 Bologna, Italy

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Fax: +39 051 356361

Google maps: <https://goo.gl/maps/dJLyYEozYhs>



For any need, please inquire with:

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## Abstracts

### **Janko Božič - Specific knowledge paths invigoration for successful transfer from science field to bee management practice**

*University of Ljubljana, Slovenia*

We had some general discussion at international conference of beekeeping organizations in Celje recently on the topic of knowledge transfer. There is a general agreement of need for better knowledge transfer but with weak identification of the main problems in this process. That can be recognized in generalized declaration of the conference, which can help in the support of specific development in this field. I tried to introduce general concepts with indication of the narrow paths which needs in the future extensive development to insure so generalized idea of the necessary bee colonies management value of the honeybee and beekeeping research.

## **Siobhan Maderson - Two-Way Traffic on the Bridge: Investigating Communication Between Beekeeping Research and Practice**

*Aberystwyth University, Wales, United Kingdom*

Multiple challenges to bee and pollinator health have led to a recent surge in scientific research, and government policy initiatives designed to ensure bee's well-being. Many of the political responses emphasise the importance of engaging with beekeepers, whose experiential knowledge and long-term observations of bees and changing local environmental conditions may hold great potential in monitoring and improving bee health. However, many beekeepers state they are often sidelined in research design, or express frustration with their seemingly secondary position in research and debates.

This presentation is based on PhD research currently in progress. Based on over thirty in-depth semistructured interviews with long-term beekeepers, my preliminary data suggests there is room for improved communication and collaboration between beekeepers and researchers. Many of my interviewees hold significant positions of influence in the beekeeping community.

Research on Citizen Science, and Local Environmental Knowledge, offer guidance and models of how to improve engagement with the knowledge held by non-members of the formal academic community. By investigating the knowledge of beekeepers and their positions of influence within the beekeeping community, bridges between research and practice can be strengthened, with an increase in mutually beneficial two way traffic.

## **Aslı Özkırım - The Differences Between Scientific and Beekeeper's Languages**

*University of Hacettepe, Ankara, Turkey*

Most of the beekeepers respect the scientific researchs and vulnerable to apply the results of science in their apiaries. By this reason they are willing to follow beekeepers journals and/or attend to beekeepers congress, symposium or seminars. On the other hand beekeepers always complain about the talks of scientists that is mostly boring and obscure (as mentioned by them). They think that presentations of scientists contain lots of scientific terms and graphics, statistics and etc. And also scientific application or theoretical information of science does not fit practical beekeeping. In this study, it will be presented some techniques to avoid these kinds of problems explained above by videos and photos from beekeepers seminars and meetings. It would help to develop new techniques and /or create new proposal project about this subject during the workshop.

## **Flemming Vejsnæs\*, Victoria Soroker\*\* - Outline for the Coloss varroa book – a practical user guide**

*\* Danish Beekeepers Association, Denmark; \*\* Zrifin Apiary, Institute of Plant Protection, Agricultural Research Organization, The Volcani Center, Israel.*

The aim of the WG6 and B-rap is to transfer information to beekeepers. Norman Carreck did outline in his presentation in Cluj, that there is a need of such a book on the market and that IBRA would probably support this project.

We suggest to prepare a practical book for beekeepers focused on Varroa control methods. The general idea is as follows:

The book will start by presenting the history of the Varroa problem world-wide. The difficulties of Varroa control will be presented along with the essence of sustainable Varroa management, specifying advantages of this approach. After a summary of methods listed in the literature, chapters devoted to proven methods will follow. Each chapter will describe in details with schemes and photos of the specific method. At the end of each chapter pros and cons of each method will be presented. Eg. use of organic acids one by one; different essential oils; bee population manipulations such as , brood removal, queen caging and more..... A separate chapter will be devoted to breeding for varroa resistance. Different bees' traits that promote some Varroa resistance will be described. Current status on breeding for Varroa resistance will be presented.

Methods popular in different countries will be discussed along with a need to adjust the treatment to local conditions and legislations.

The final chapter will be devoted to integrated management approach (IVM), presenting a few best combinations of techniques.

As addition to a book, it would be relevant to have a books homepage, with video instructions and regular updates on new achievement. Suggestion for a name: [www.colossvarroa.org](http://www.colossvarroa.org) .

The idea is to make it as practical as possible and we need lot of contributors. We suggest that working groups will make chapters based on the outcome of their common activities.

On the long-term the book should consist of 2 parts – book and homepage (instruction videos).

The idea is to offer different countries to make a translation.

Suggestion for chapters is listed below:

1. Introduction
2. History Varroa invasion, when, where, what, how does it harm? Varroa-Virus interaction – how does it effects colony health? Why it so difficult to control Varroa? Is it important to control Varroa?
3. Varroa monitoring: Why is it important to know how many Varroa do you have in a colony?
4. How do you check for Varroa? What the numbers tell you?

What is Sustainable Varroa treatment – why is it important?

5. Dronebrood removal
6. Formic acid – all relevant methods are described. Pros and cons
7. Lactic acid - all relevant methods are described. Pros and cons
8. Oxalic acid - all relevant methods are described. Pros and cons
9. Essential? oils - all relevant methods are described. Pros and cons

10. Creating brood free colonies due to varroa treatment.
  11. Producing nucs are important varroa treatment.
  12. Breeding bees for Varroa resistance
  13. What is used in different countries – data or even article from the monitoring group from the winterloss questionnaire.
  14. Visiting different beekeepers in different countries, having success with sustainably varroa treatment. (We chose countries that are very different. Like no need to have Denmark and Sweden in at the same time.
  15. Integrated Varroa management
  16. Strange/weird/alternative methods. Discuss other methods that are doubtful. Could be small cell size, pseudoscorpions etc. Explain what is true and what is false?
- Appendix: often asked questions and answers about the Varroa and its control
- Doing this book, we need an editor group and the more writing, the better.



## Programme

The participants are requested to contribute with a registration fee of 30 Euros.

COLOSS Workshop B-RAP Core group "BRIDGING RESEARCH AND BEEKEEPING PRACTICE" CREA-API, Bologna (Italy), 22-23 March 2017	
Agenda	
<b>21 March 2017</b>	
At 20:00	<b>Social dinner offered by Chemicals Laif</b>
<b>22 March 2017</b>	
10:30 - 11:00	<b>Registration and welcome</b>
11:00 - 13:00	<b>Varroa taskforce – B-RAP joint meeting:</b> Here, we will discuss the subjects of common interest between B-RAP group and WG6 of Varroa Taskforce, and the possibility of further cooperation (continuation of Cluj-Napoca meeting)
	R. Büchler, A. Uzunov: <i>COLOSS Roadmap towards sustainable Varroa control</i>
	F. Vejsnæs, V. Soroker: <i>Outline for the COLOSS varroa book – a practical user guide</i>
	General discussion and how to continue
13:00 - 14:00	<b>Lunch</b>
14:00 – 14:30	<b>Introduction and status of the B-rap group.</b> Flemming Vejsnaes & Preben Kristiansen
14:30 – 15:30	S Maderson: <i>Two-Way Traffic on the Bridge: Investigating Communication Between Beekeeping Research and Practice</i>
15:30 – 16:00	<b>Coffee break</b>
16:00 - 17:00	M Ljung <i>Extension toolbox.</i>
17:00 - 19:00	<b>Discussions about extension</b>
<b>23 March 2017</b>	
09:00 - 10:00	A Özkırım: <i>The Differences Between Scientific and Beekeeper's Languages</i>
	Janko Božič: <i>Specific knowledge paths invigoration for successful transfer from science field to bee management practice</i>
10:00 - 12:30	<b>Discussions about webinars and e-learning</b>
	<b>Discussions about surveys and questionnaires</b>
12:30 - 13:30	<b>Lunch</b>
13:30 - 14:30	<b>Discussions about surveys and questionnaires</b>
14:30 - 15:00	<b>Discussion about ideas and work in the future</b>

## Workshop summary

During the workshop talks were given by Ralph Büchler, Victoria Soroker and Flemming Vejsnæs, Siobhan Maderson, Magnus Ljung, Asli Özkirim (via Skype) and Janko Bozic. In addition to the talks Flemming Vejsnæs gave a report on webinars and Preben Kristiansen showed an example of software for web based courses used in Sweden. We had discussions based on the different talks, and we even discussed the drafts of the questionnaires for the surveys that we intend to do.

### Wednesday 22 March

The first part of the B-RAP workshop was held together with the Varroa Control workshop that started the day before. Ralph Büchler (RB) gave a talk titled: "Coloss Roadmap towards sustainable Varroa control" (see attached pdf of the presentation). In his talk RB mentioned that the goal is prevention of colony losses and limitation of chemical treatments. He also suggested a time schedule for the tasks of the different work groups involved with issues regarding varroa. After that Victoria Soroker (VS) and Flemming Vejsnæs (FV) presented some ideas and a draft of content regarding a Varroa book that was discussed in Cluj (see the attached suggestion). After discussion based on the talks we decided to assign VS, FV and RB to be responsible for making a draft/synopsis for a book that can be discussed at the next COLOSS-conference.

Before we continued with the B-RAP workshop PK and FV gave a short update of the work of the B-RAP core project, the history, what we have achieved so far and what our plans are.

In a talk with the title "Two-Way Traffic on the Bridge: Investigating Communication Between Beekeeping Research and Practice" Siobhan Maderson (SM), a Phd student at Aberystwyth University, Wales, presented results from her project (The Traditional Environmental Knowledge of Beekeepers' Civil Society Organisations: A Charter for Environmental Sustainability?). So far SM has carried out over thirty in-depth interviews with long-term beekeepers, and the preliminary data suggests there is room for improved communication and collaboration between beekeepers and researchers. By investigating the knowledge of beekeepers and their positions of influence within the beekeeping community, bridges between research and practice can be strengthened, with an increase in mutually beneficial two way traffic.

Magnus Ljung, who works as a principal extension specialist at the National Competence Centre for Advisory Services, Swedish University of Agricultural Sciences, gave a talk about extension, different models and how focus has changed over time. Over the 20th century we have seen a shift in what we believe makes extension successful. In short it could be described as moving from DOING TO > DOING FOR > DOING WITH. ML stressed the importance of "Putting the last first", which means that we should start from the perspective of the beekeeper. It is also important to know our clients and to plan communication. A pdf of ML's talk will be forwarded to members of the B-RAP group at a later stage.

After the talks by SM and ML we had a very fruitful discussions about the results and suggestions they had presented, how we can improve what we are doing regarding transfer of knowledge and with what means and tools. We agreed that it would be a good idea to have a course in which we could learn more about best practices of extension.

### Thursday 23 March

Via Skype Asli Özkirim (from University of Hacettepe) gave a talk with the title "The Differences Between Scientific and Beekeeper's Languages". AÖ presented some techniques to avoid the complaints that many beekeepers often express regarding talks by scientists; the presentations contain lots of scientific terms and graphics, statistics and etc. From her own experience giving talks AÖ gave some examples and good ideas.

In the next talk Janko Božič (JB), who works at the University of Ljubljana, Slovenia, told about the knowledge flow in Slovenian beekeeping, and about activities for invigoration of the knowledge network (see attached pdf of the presentation).

After the two talks we continued the discussion that we started on Wednesday, and Fani Hatjina summarized what we have learned about "Toolbox for good extension" in the following ten points:

1. More practical workshops
2. Feed back questionnaires (from participants in workshops, talks etc.)
3. Analyze the target group/ speak their language
4. Perform yourself in videos
5. Use a lot of material
6. Have your ambassadors
7. Aim at capacity building
8. Exchange visits
9. Use the beekeepers apiaries
10. Citizen Science approach

Before we started the discussion about the questionnaires for the surveys, Flemming Vejsnæs gave a talk about webinars and we discussed whether this is a tool that would work well regarding knowledge transfer to beekeepers. Preben Kristiansen showed a software that is used for web based courses in Sweden, and told that it is now being used as an introductory course in the training of bee inspectors. We agreed that we should explore the possibilities of e-learning and how we can use the different applications and tools in our work.

At the two previous workshops we have decided to make three surveys and drafts for questionnaires have been made. One survey is among beekeepers, one among all COLOSS countries and one among all COLOSS members. Before going through the drafts for the questionnaires we had a discussion about the reasons for surveys. We want to get information that can improve our work. That is important to explain to the different groups we ask, otherwise the motivation for answering may be low. The survey among beekeepers is the most important and during the discussion a number of suggestions on how to improve the questionnaire came up, e.g. questions on environmental factors that have affected the beekeeping over time. The plan is to conduct that survey in the fall of 2017, and to ask the monitoring group for help translating and distributing the questionnaire. Suggestions to improve the other questionnaires were also given, e.g. questions on how to facilitate the learning process for beekeepers with different disabilities. It was decided that PK and FV are responsible for the work to finalize the questionnaires, and that the questionnaires should be discussed with people working with social science before starting the surveys. Both SM and ML offered to help improving the questionnaires.

An issue we discussed during the workshop was the relation between the B-RAP and the other COLOSS groups. We have discussed this question earlier, but it was recently actualized when FV and PK was asked whether they could participate as B-RAP representatives in the Survivors workshop. Instead of that we decided to suggest the different groups to assign one or two representatives who can be members of the B-RAP group.

Thanks to all participants for the good work and special thanks to Antonio Nanetti and his staff for a very well organised workshop.

\*\*

Preben Kristiansen and Flemming Vejsnæs

## List of participants

	Member	e-mail	Affiliation	Country
1	Patricia Aldea	<a href="mailto:PATRICIA.ALDEA@MAYO">PATRICIA.ALDEA@MAYO</a>	Universidad Mayor, Santiago	Chile
2	Sergio Angeli	<a href="mailto:sergio.angeli@unibz.it">sergio.angeli@unibz.it</a>	Free University of Bolzano	Italy
3	Janko Božič	<a href="mailto:janko.bozic@bf.uni-lj.si">janko.bozic@bf.uni-lj.si</a>	University of Ljubljana	Slovenia
4	Ralph Büchler	<a href="mailto:ralph.buechler@llh.hesse">ralph.buechler@llh.hesse</a>	Landesbetrieb Landwirtschaft Hessen Bee	Germany
5	Ilaria Cardaio	<a href="mailto:ilaria.cardaio@gmail.com">ilaria.cardaio@gmail.com</a>	CREA-API, Bologna	Italy
6	Cecilia Costa	<a href="mailto:cecilia.costa@crea.gov.it">cecilia.costa@crea.gov.it</a>	CREA-API, Bologna	Italy
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1	Nikola Kezic	<a href="mailto:nikola.kezic@zg.t-com.hr">nikola.kezic@zg.t-com.hr</a>	Faculty of Agriculture, University of Zagreb	Croatia
1	Preben	<a href="mailto:preben.kristiansen@biodi">preben.kristiansen@biodi</a>	Swedish Beekeepers Association, Skanninge	Sweden
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1	Siobhan	<a href="mailto:sim30@aber.ac.uk">sim30@aber.ac.uk</a>	Aberystwyth University	United
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1	Flemming	<a href="mailto:fv@biavl.dk">fv@biavl.dk</a>	Danish Beekeepers Association, Sorø	Denmark

## Travel and local information



Bologna is the largest city (and the capital) of the Emilia-Romagna Region in Northern Italy. This city is the home to the oldest university in the world, University of Bologna, founded in 1088. Bologna hosts thousands of students who enrich the social and cultural life of the city. Famous for its towers and lengthy porticoes, Bologna has a well-preserved historical centre (one of the largest in Italy) thanks to a careful restoration and conservation policy which began at the end of the 1970s, on the heels of serious damage done by the urban demolition at the end of the 19th century as well as that caused by wars.

This city is an important cultural and artistic centre, its importance in terms of landmarks can be attributed to a varied mixture of monuments and architectural examples (medieval towers, antique buildings, churches, the layout of its historical centre) as well as works of art which are the result of a first class architectural and artistic history.

Bologna is also an important transportation crossroad for the roads and trains of Northern Italy, where many important mechanical, electronic and nutritional industries have their headquarters. Bologna is home to numerous prestigious cultural, economic and political institutions as well as one of the most impressive trade fair districts in Europe.

### Accommodation

Bologna offers plenty of different solutions for your accommodation. You may check the one that best suits you on your preferred booking search engine.

However, for your convenience a short list of hotels is provided herewith:

- hotels in the centre: [Hotel Cristallo](#), [Hotel University](#), [Hotel Paradise](#), [Hotel Cavour](#), [Nuovo Hotel del Porto](#), [Hotel University](#).
- hotels close to [CREA-API](#): [Hotel Arcoveggio](#), [HC3 Hotel](#), [City Hotel](#), [Hotel Corticella](#).

You may also explore other possibilities, like [B&Bs](#) and [Forestries](#).

### Travelling to and inside Bologna

The [Bologna Airport "Guglielmo Marconi"](#) is easily connected to the major International destinations. From the Arrivals exit, you may take the [Aerobus shuttle](#), that leaves every 11 minutes and connects to downtown Bologna and Central railway station in 20-25 minutes for 6 Euros. Taxi is obviously a more expensive option.

If you are traveling by train, Bologna is well connected with fast trains (FRECCIE) to the main Italian cities. You may check your connections here: <http://www.trenitalia.com/tcom-en>.

If you are coming by car, exit the motorway at Bologna and take the bypass (tangenziale). Get off the bypass at exit 6 (Castelmaggiore). Follow signs for the city centre and turn left at the traffic light of Via di Saliceto.

Within Bologna, public transportation is generally rather convenient and cheap. You may install on your smartphone the application Moovit, that assists you real-time when travelling on busses or local trains. Tickets are sold in the shops or, in most busses, also on-board. In the last case you need change, though. Once stamped, the ticket is valid for 75 minutes within the city. Within that time, you are allowed to change bus without buying a new ticket. Citypass is less expensive ticketing if you travel on bus 10 times.

CREA-API is well served by the bus line 27, direction Corticella. Leave the bus at the stop "Caserme rosse", which is 11 stops away from city centre (Via Rizzoli). Walk back 50 metres and turn left: CREA-API is the first building on your right.



#### CREA-API

(Honey bee and Silkworm Research Unit of National Council for Agricultural Research and Economics)  
Via di Saliceto 80  
40128 Bologna, Italy



# Coloss Roadmap towards sustainable Varroa control

Dr. Ralph Bächler



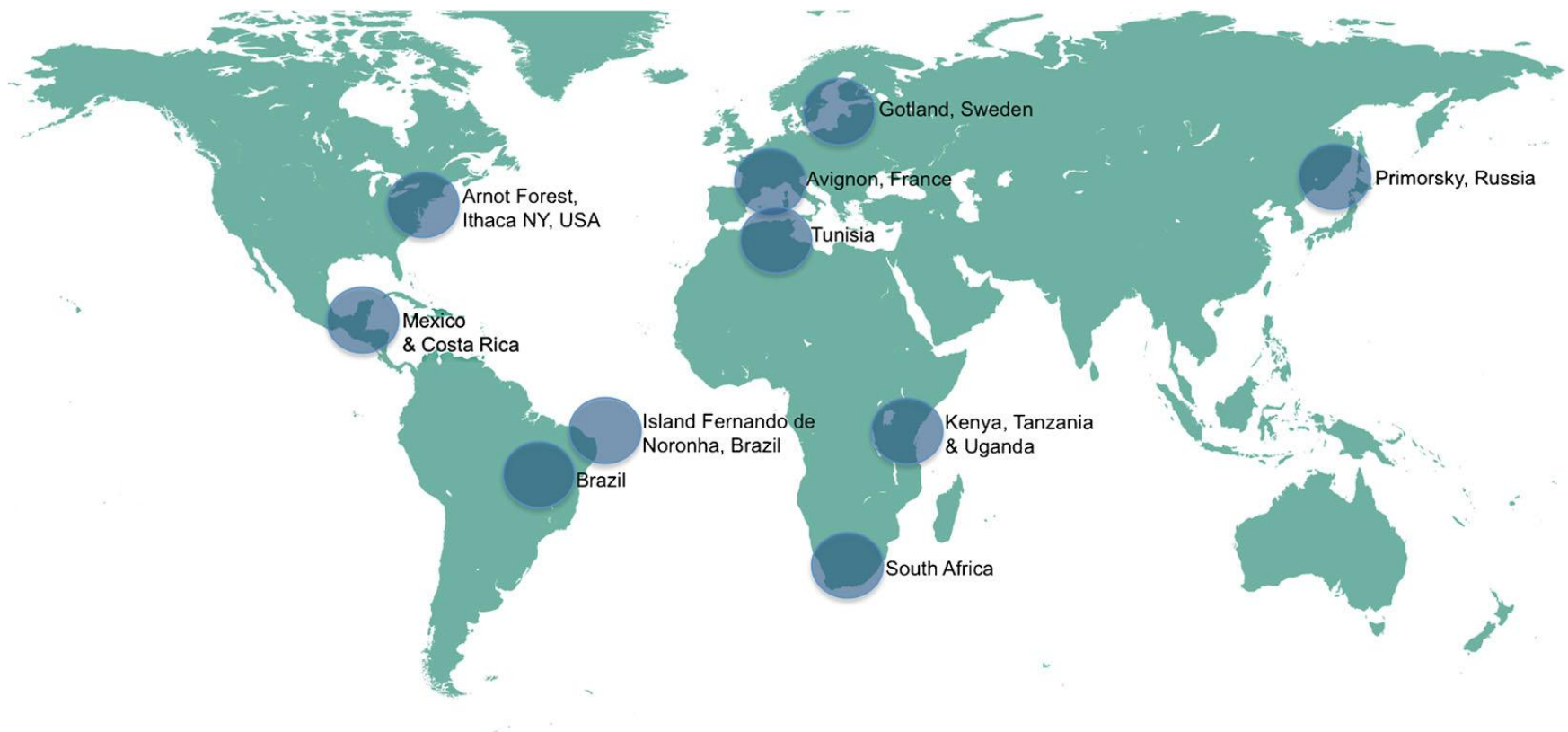
## Goal



- **Prevention of honeybee colony losses**
- **Limitation of chemical treatments**



## Promising examples:



Locke (2015): Natural *Varroa* mite-surviving *Apis mellifera* honeybee populations, *Apidologie*, open access

# Background of resistant populations

## Consequence of long term natural selection

### ❖ Adaptation of population density

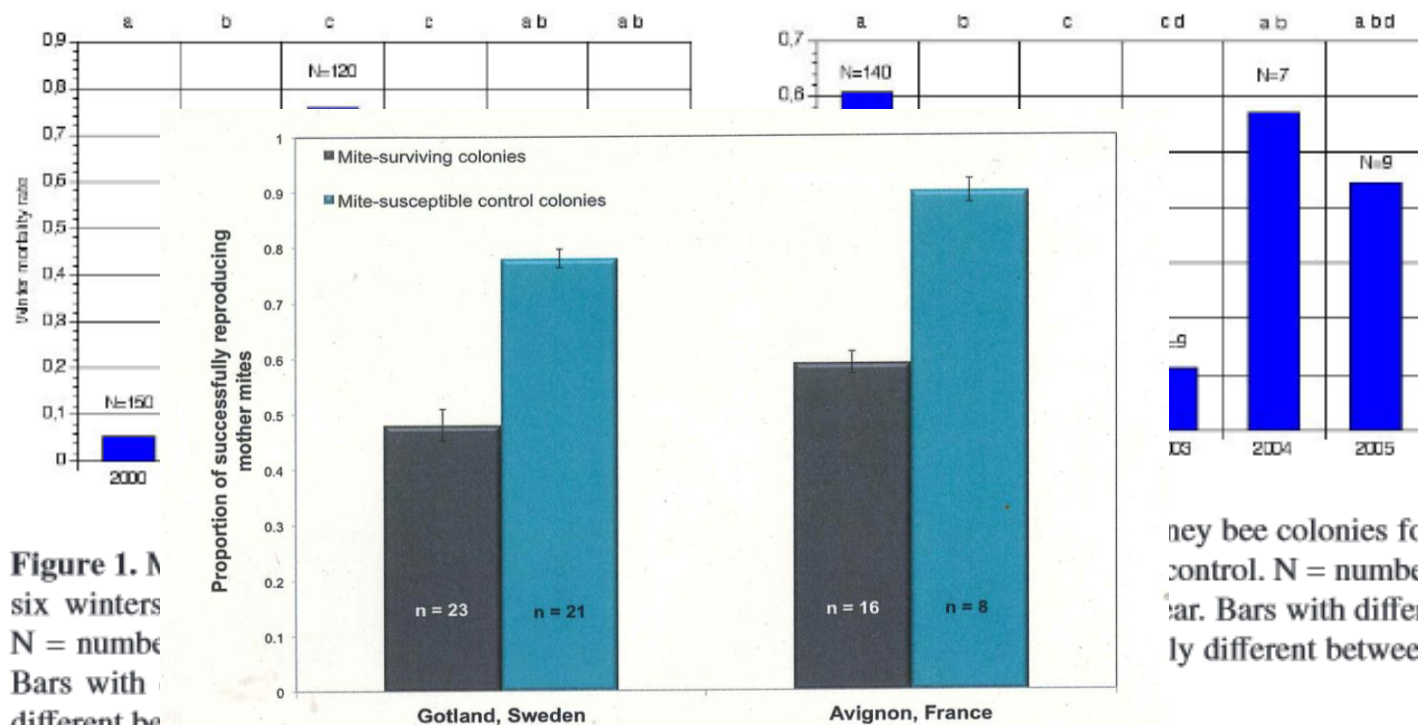


Figure 1. Mite mortality ratios in six winters (2000-2005). N = number of colonies. Bars with different letters are significantly different (p < 0.05).

Figure 2. Mean proportion of successfully reproducing mother mites in the Varroa mite-surviving colonies and the mite-susceptible control colonies in Avignon, France, compared to Gotland, Sweden, with standard error bars.

key bee colonies for control. N = number of colonies. Bars with different letters are significantly different between years (p < 0.05).

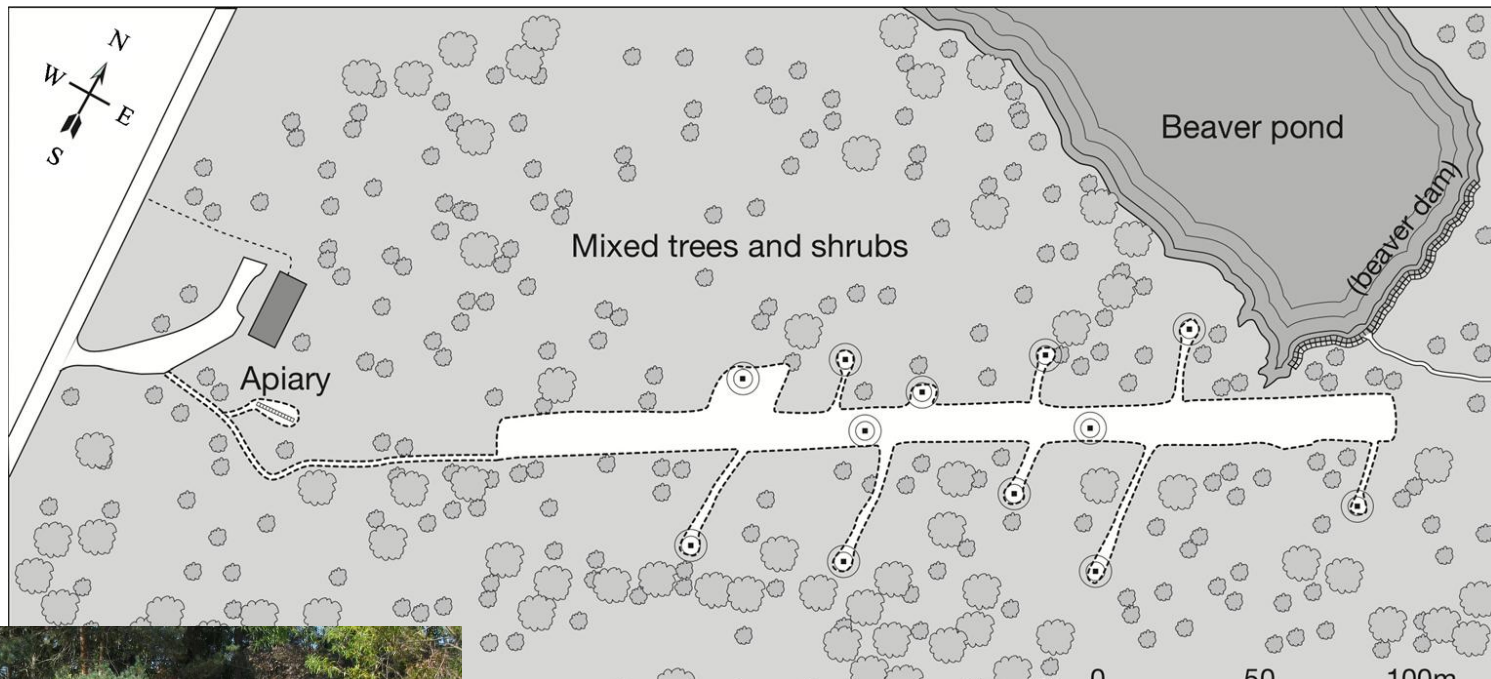
Fries et al. (2008)

te. Apidologie 37, 1-7

Locke et al. (2012): Host adaptations reduce the reproductive success..., Ecol & Evol. 2(6), 1144-1150

# Some colonies need to survive

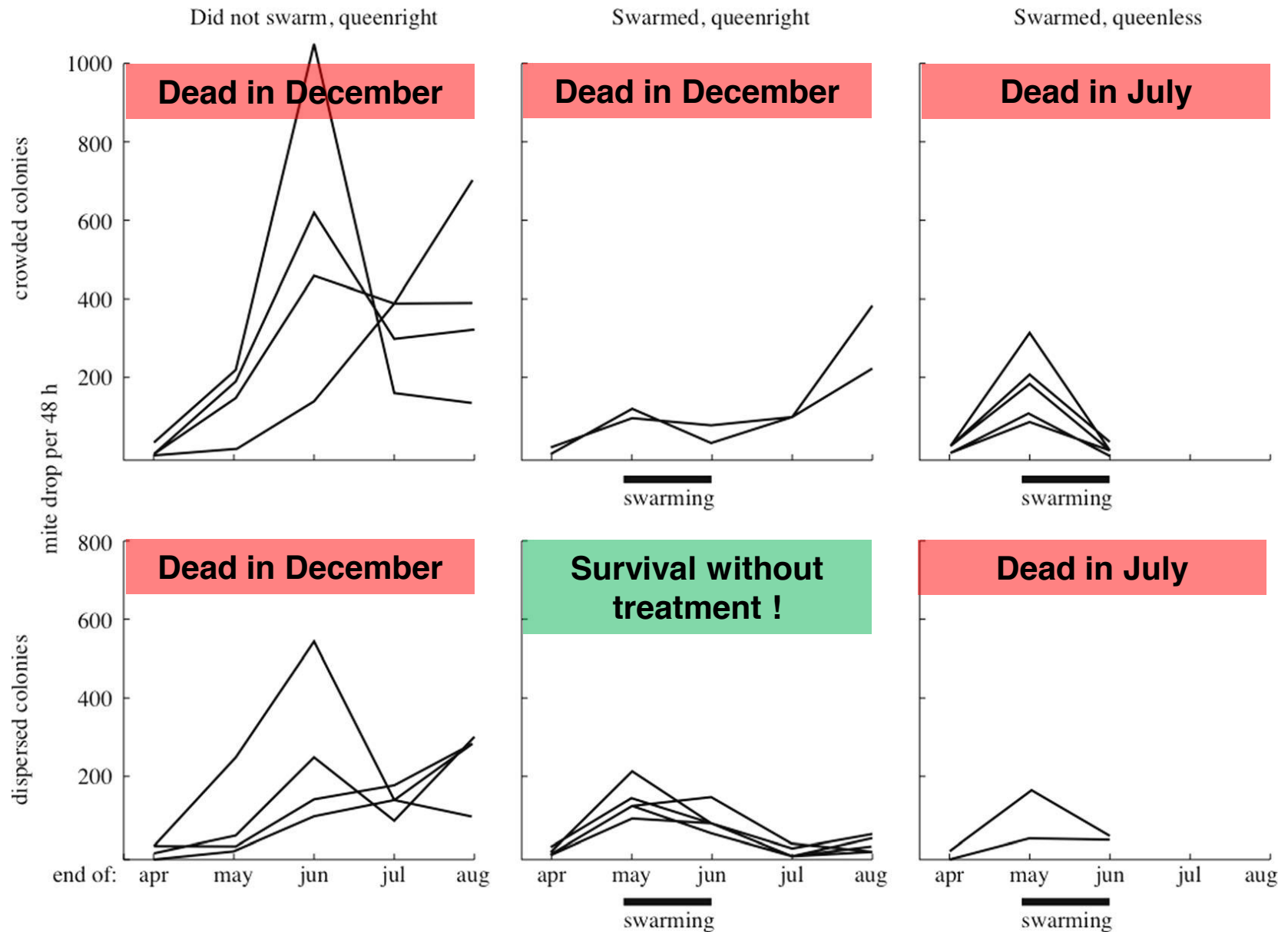
Seeley & Smith (2015): Apidologie 46:716-727



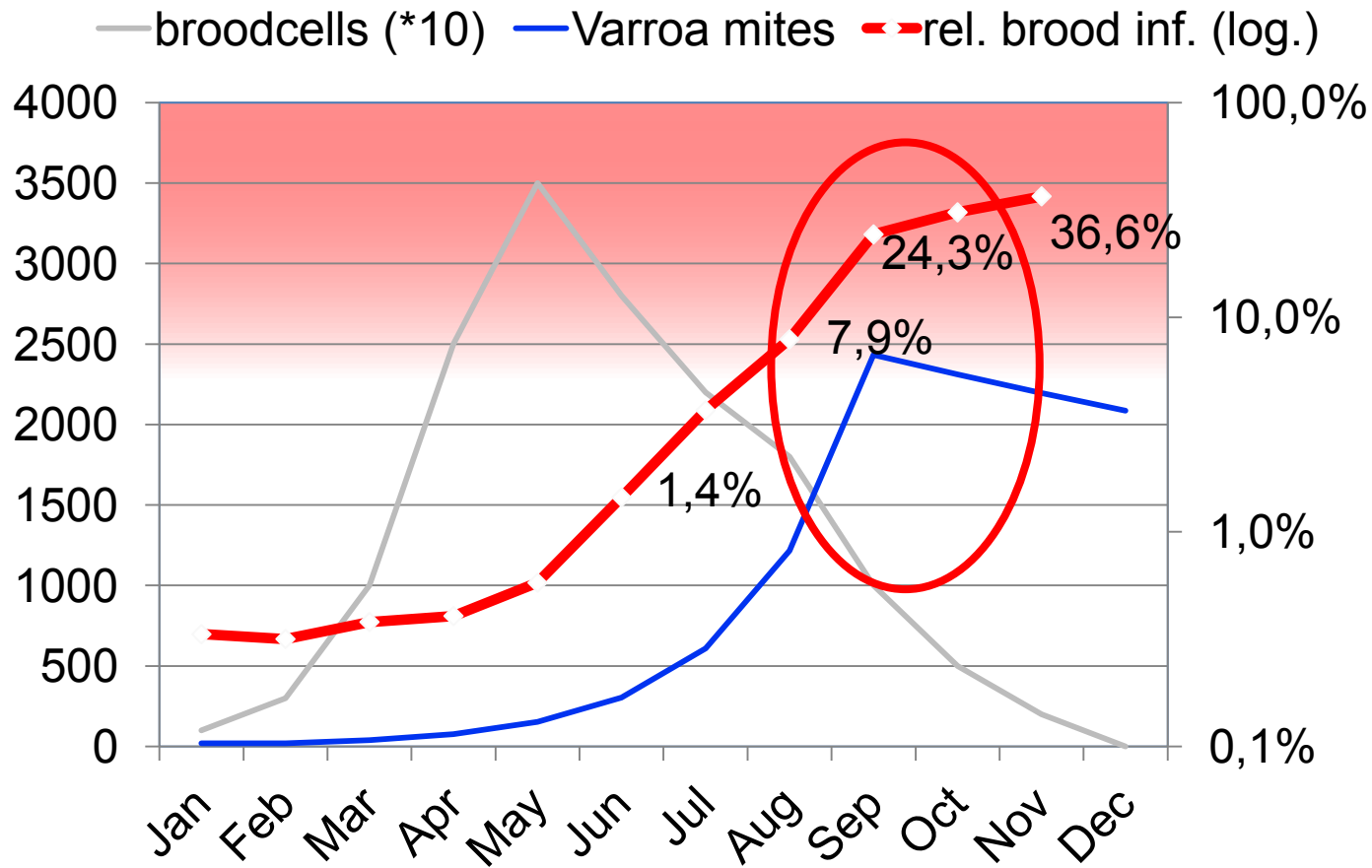
**Spreading the hives at least 100 feet apart resulted in lower mite counts and better colony health and survival.**



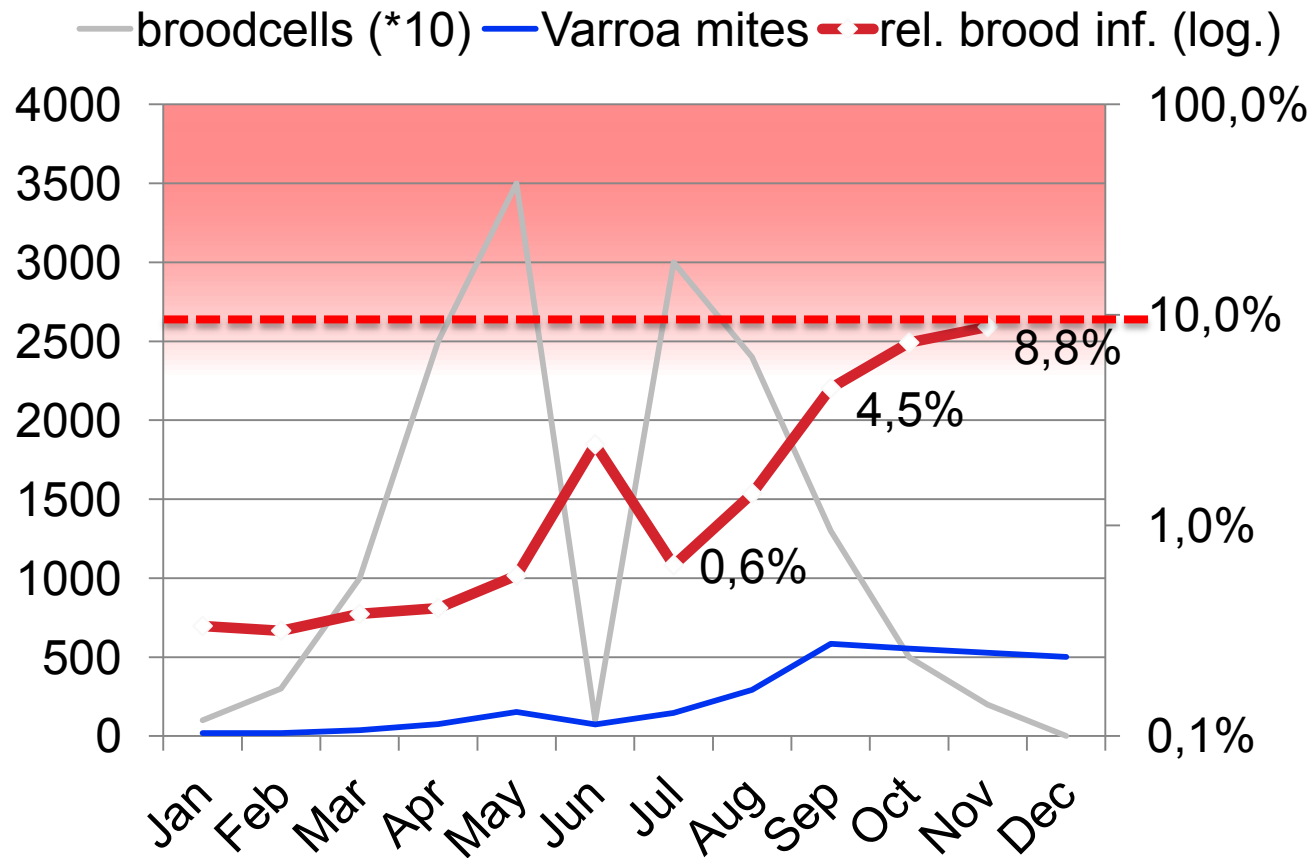
# Varroa infestation development and survival



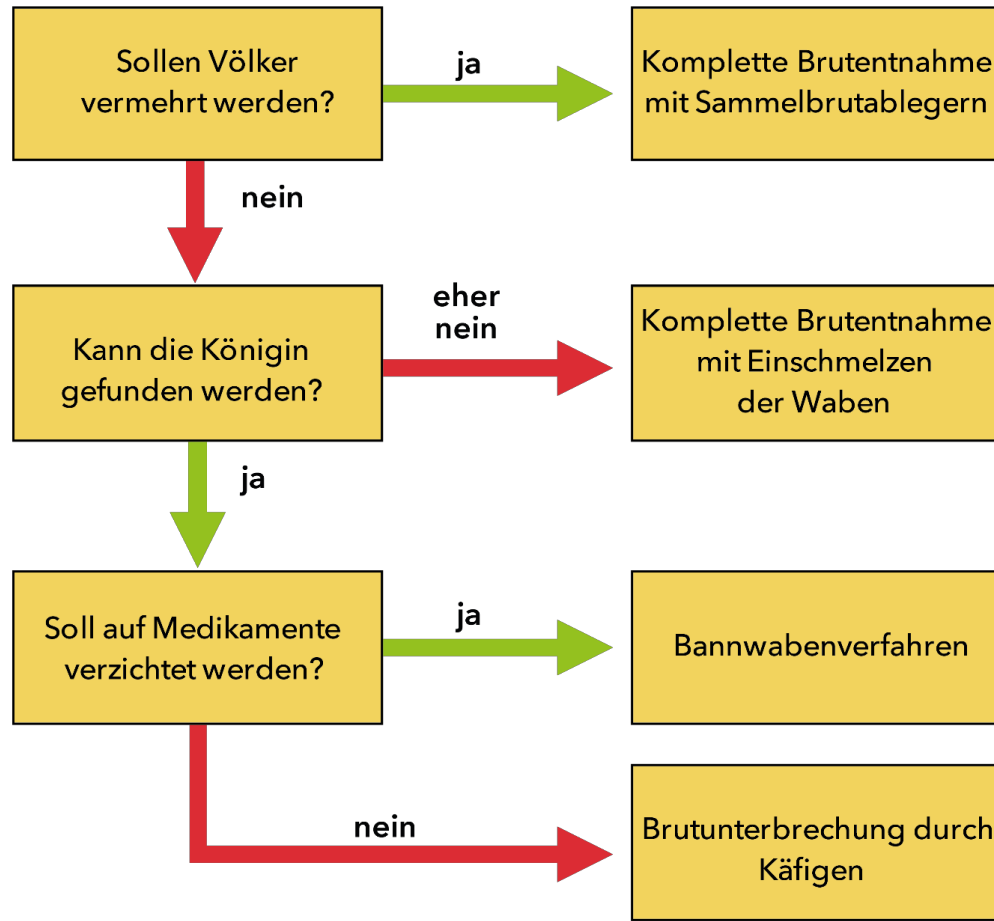
## Bee and mite population dynamics under common beekeeping conditions



# Bee and mite population with natural swarming



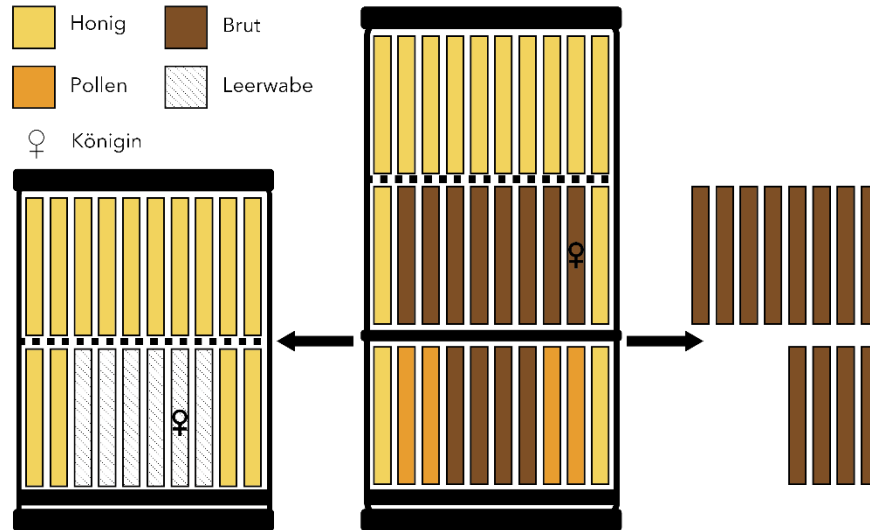
# Coloss WG Varroa: Development of suitable brood interruption methods



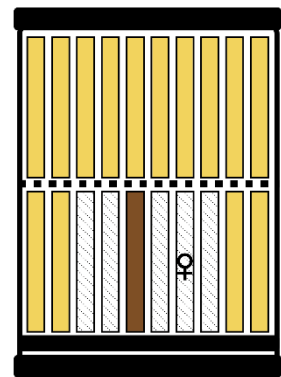
# Total brood removal

Honig Brut  
Pollen Leerwabe

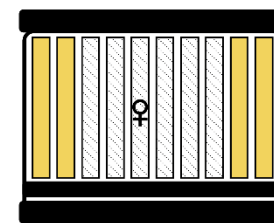
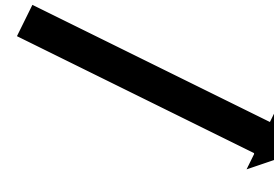
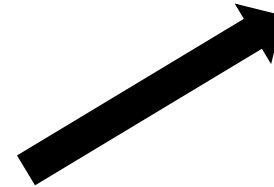
♀ Königin



Tag 0



Tag 0



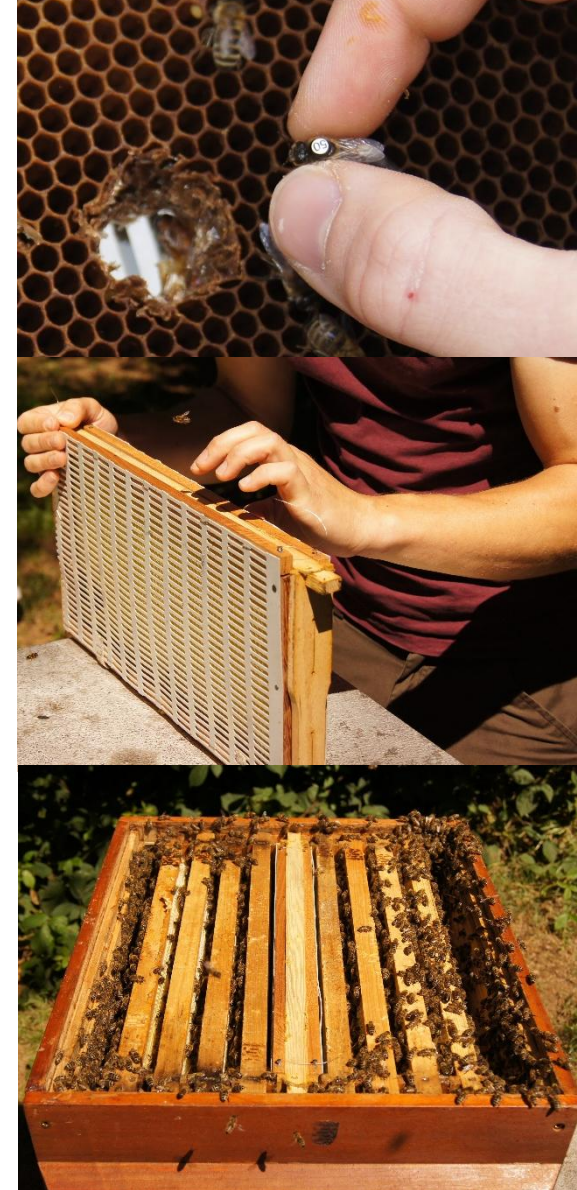
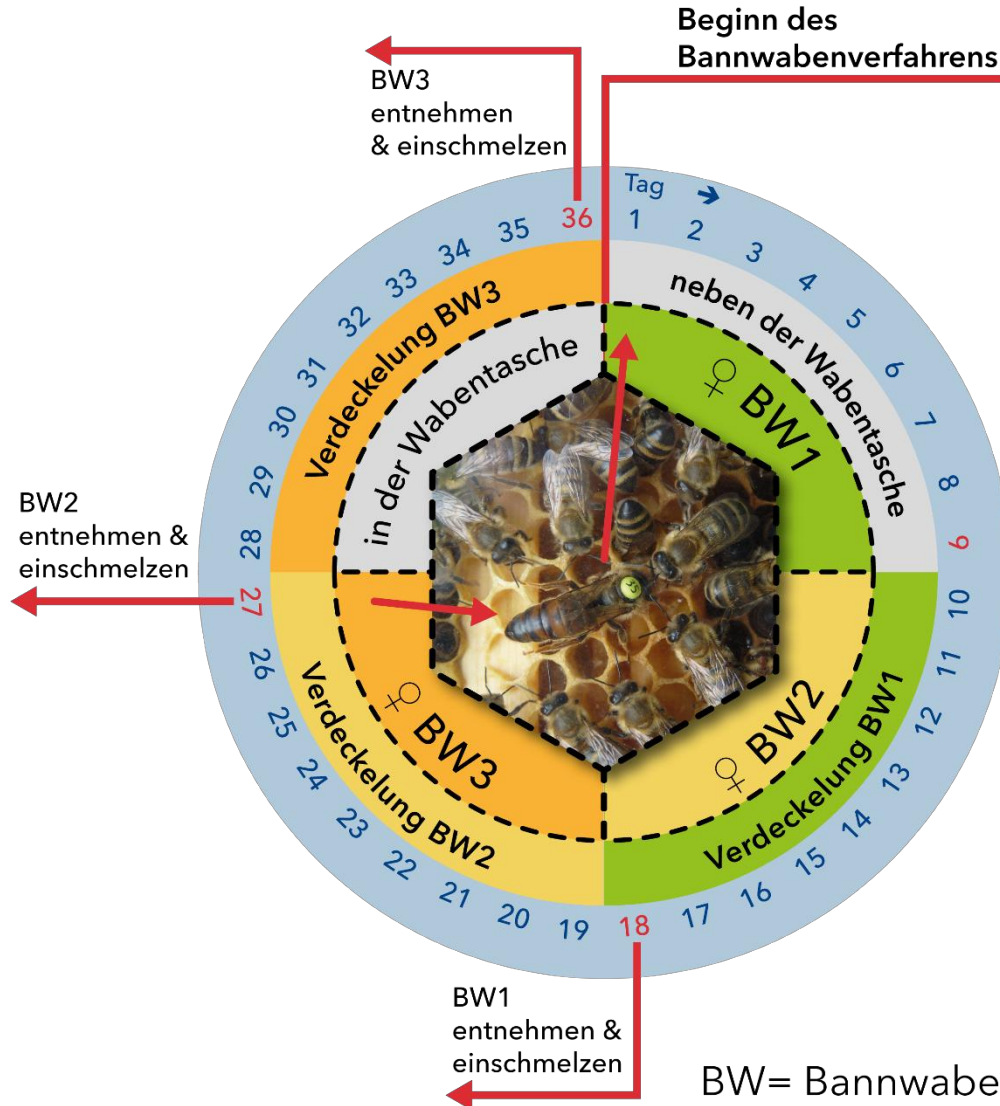
Tag 0 bis 3

Oxalsäure





# Trapping comb technic





# Brood interruption combined with acaricid treatment



Käfigen der Königin

Brutunterbrechung



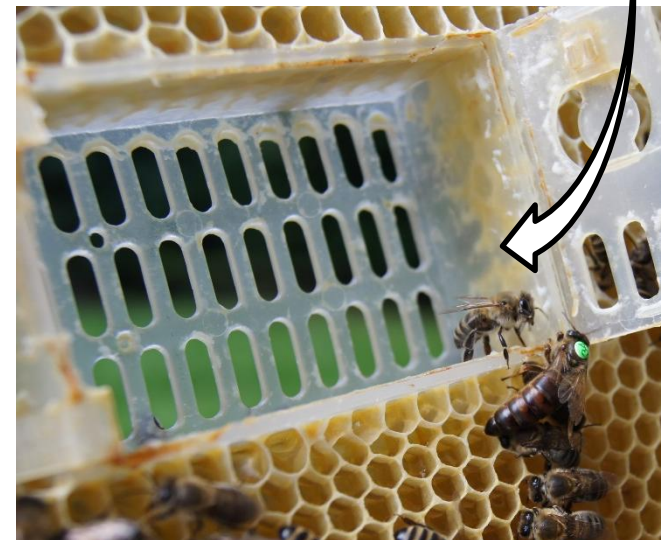
25 Tage Wartezeit



Behandlung des

Oxalsäurebehandlung

brutfreien Volkes





## Coloss WG Varroa:

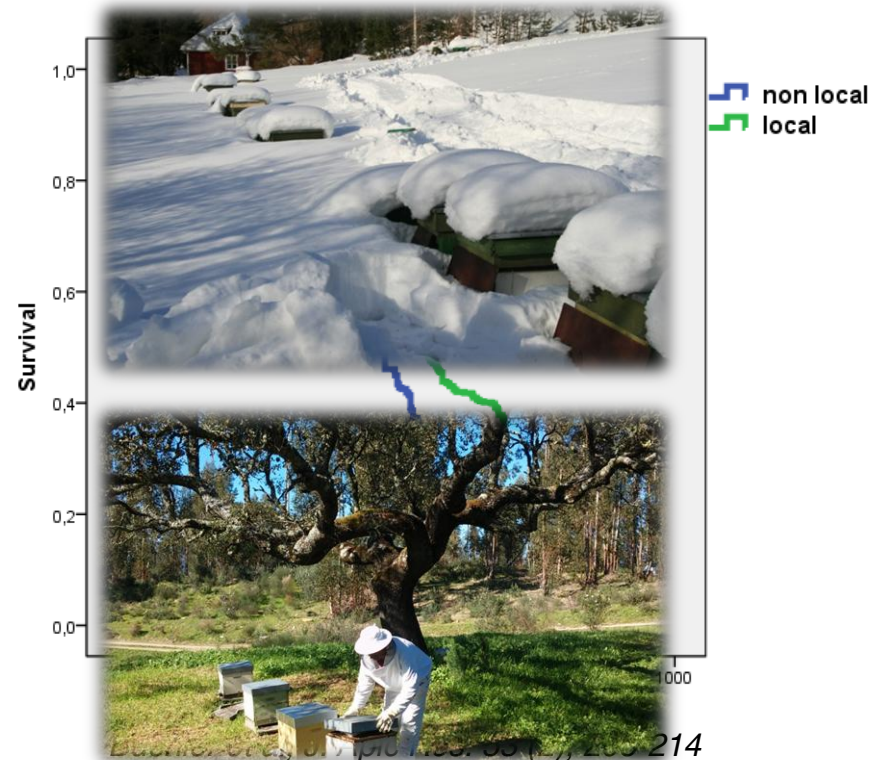
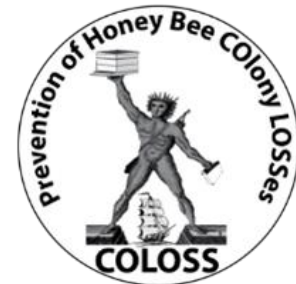
## Tools for an integrated control concept

### Infestation control methods and regional threshold levels



# Coloss WG Breeding

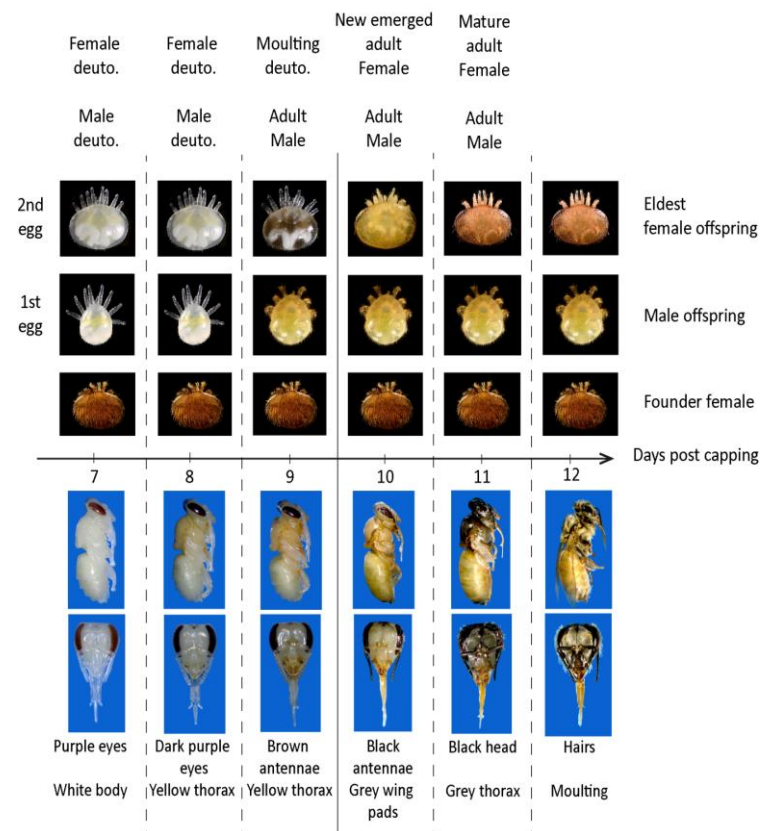
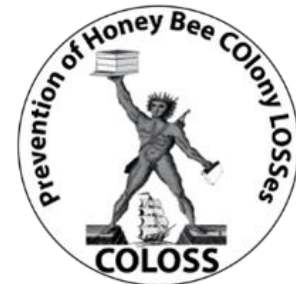
## Understanding genetic adaptation





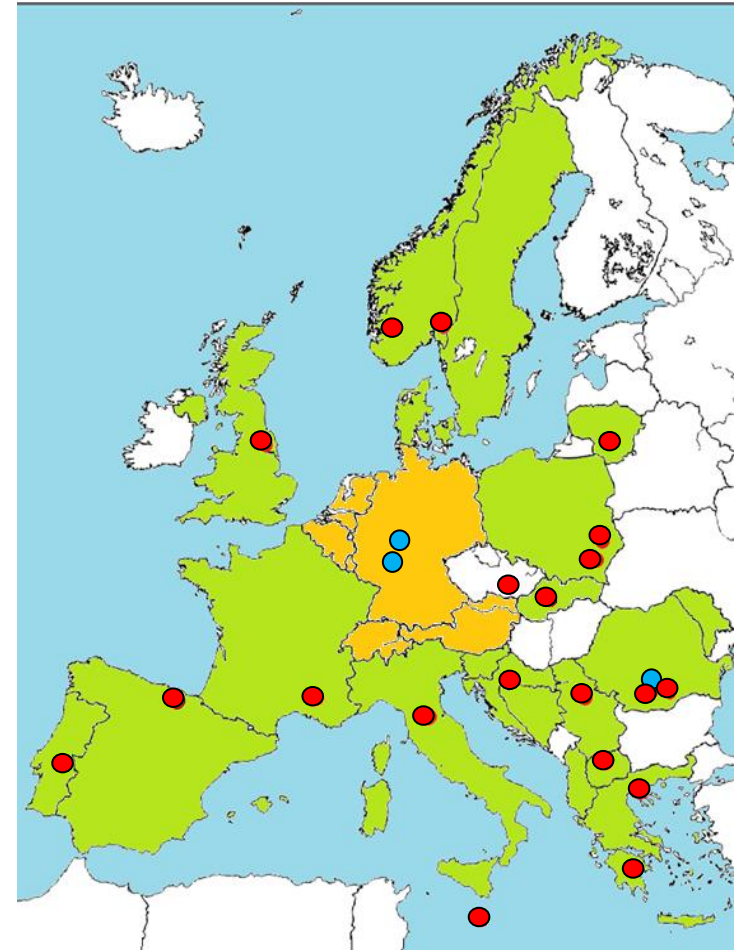
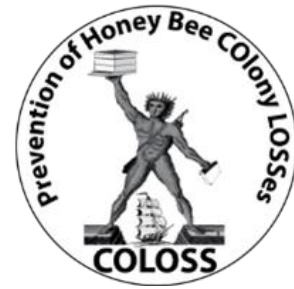
# Coloss WG Breeding

## Exploring resistance characters



# Coloss WG Breeding

## Performance testing and selection of local populations

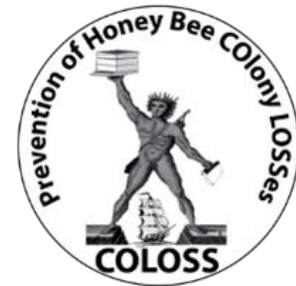




# Coloss WG B-Rap

## How to tell it to the beekeeper?





## Coloss roadmap – to be completed....

Season	WG Varroa	RNSBB	Survivors	WG B-Rap
2017	<b>Investigate brood interruption on institute level</b> <b>Threshold study</b>	<b>SMR selection</b> <b>Book on standard methods</b>	<b>Effects of viruses &amp; environment on survivor populations</b>	<b>Film sequences on brood interruption</b>
2018	<b>Investigate brood interruption with selected beekeepers (CS)</b>			<b>Online infestation monitoring</b>
2019				<b>Book on integrated Varroa control</b>
2020				
2021				



## Involvement of University of Ljubljana, Biotechnical faculty and personal experience

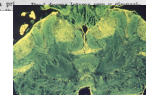
 Univerza v Ljubljani  
*Biotehniška* fakulteta, sedemdesetletnica

## Organization of youth research beekeeping camps



ČEBELARSKI PAŠNI KATASTRI (ČPK)

Za racionalno iskorišćanje čebelarstva je potrebno poznati razlijevanje medovitih rastlina, potek medjenja i razlijevanje čebelarstva. Za određivanje poteka medjenja je potrebna dobra organizirana opazovalna i prognostička služba medjenja (ne bere med). Opazovalna služba medjenja pri-

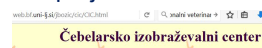


## Path to the official qualifications

Preparation of internet site



Development of the basic knowledge contents inside of the project for education of adults



Involvement in preparation of the knowledge catalogue for national professional qualification (SBA)



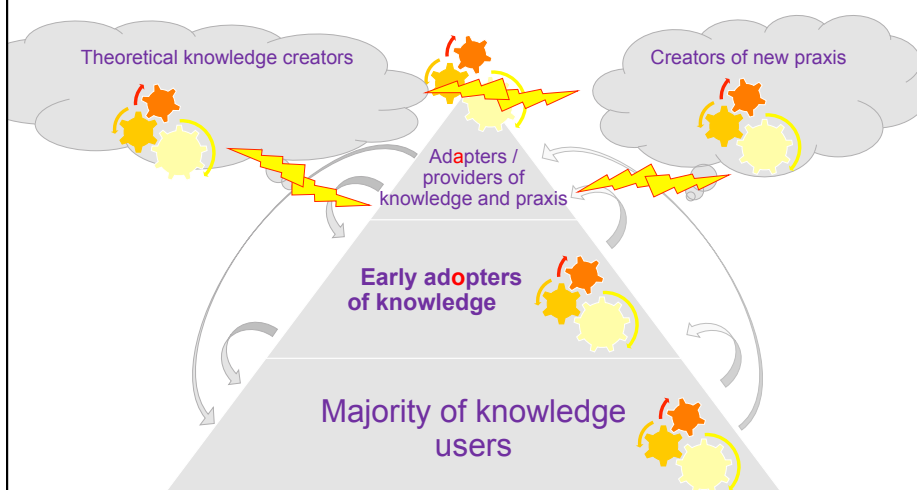
Upgrade of national qualifications with beekeeping master (SBA+CCSBS)

=> Starting point for organization of knowledge and practices



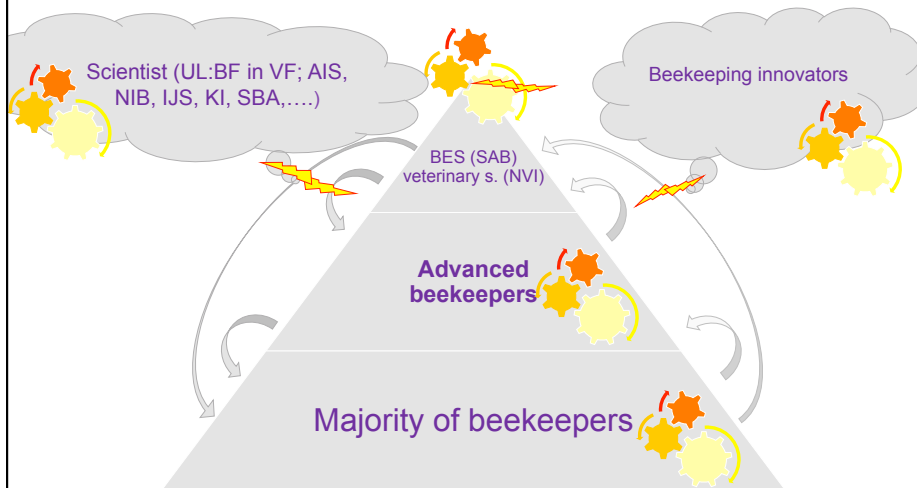
CCSBS: Chamber of Craft and Small Business of Slovenia

## Network for knowledge flow in piramide



Competences: (KSA) knowledge, skills, and abilities

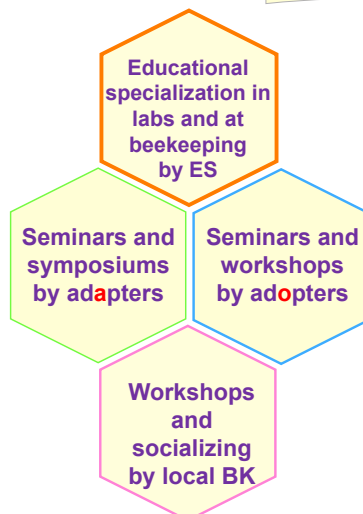
## Knowledge flow in Slovenian beekeeping

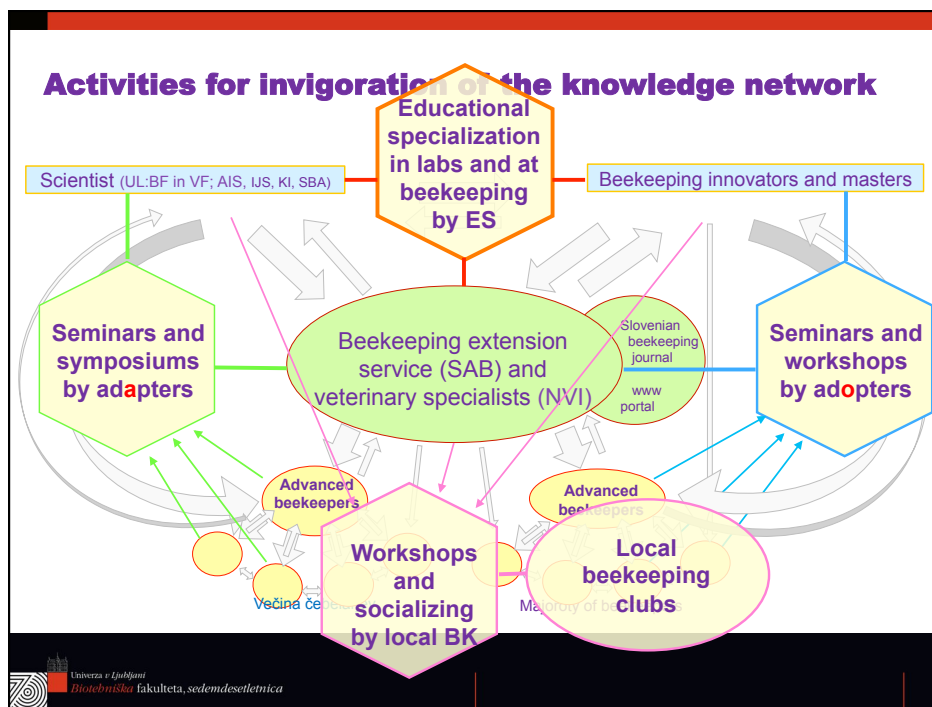


Competences: (KSA) knowledge, skills, and abilities

## What to do?

Activities for invigoration of the knowledge network





### Critical additional activities

1. Workshops and activities in local beekeeping clubs
2. Seminars and workshops of beekeeping masters & innovators
3. Educational specialization in labs and at beekeeping masters' apiaries



Don't forget on established activities!





# Thank you for attention!

<http://www.czs.si/wp/en/worldbeeday/>  
<http://worldbeeday.org/en/>



<http://www.sloveniacandidateapimondia2021.si/>



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