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VARROA CONTROL TASKFORCE 2016 WORKSHOP

ASSESSMENT OF ALTERNATIVE METHODS FOR VARROA CONTROL

Proceedings



Unije, Croatia, 19th – 20th May 2016

Island of Unije info:



Unije is part of the Cres-Lošinj archipelago and one of the islands situated furthest to the west in the series of small open-sea Adriatic islands. The island is hilly (its highest peak is Kalk, 138 m). The north-western open-sea coast is steep (Vele and Male Stijene), whereas the south-western part, with its small peninsula of Polje, has fertile land, loess and drinkable water spring.

The only settlement on the island of Unije bears the same name. It is a typical fishing and farming village which contains 280 houses. The year round population of Unije is less than 85 residents and grows to more than 400 residents during the summer tourist season.

There is no automobile traffic on the island.

Accommodation: The accommodation will be organized in multi-bed rooms (2 to 3 persons) in private mansions. The price for accommodation is ca. 15 EUR per night per person. The breakfast, lunch and dinner will be served at the local Restaurant.

Registration & Fee

Breakfasts, lunches, social dinner and coffee breaks will be mainly covered by COLOSS funding. Depending on the number of participants, a workshop fee of maximal 50 EUR per person will be payable on place. Travel and accommodation costs have to be paid by the participants.

ORGANISER CONTACTS

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ASSESSMENT OF ALTERNATIVE METHODS FOR VARROA CONTROL

Schedule

18th of May 2016	Arrival to Unije
20.00	Welcome dinner
19th of May 2016	
9:00 – 9:30	Registration
9:30 – 10:15	Welcome and general presentation of Varroa control TF Nikola Kezic - Ralph Büchler – Giovanni Formato
	WG 1. Infestation assessments - Marco Pietropaoli
	WG 2. Brood interruption - Ralph Büchler
	WG 4. Formic acid management - Benjamin Dainat
10:15-11:45	Separated meeting within each working group to discuss protocols, results, strategies.
11:45 – 12:45	Oral presentations
12:45-13:00	Discussion
13:00 – 14:30	Lunch
14:30 – 16:30	Separated meeting within each working group to discuss protocols, results, strategies.
16:30 – 18:00	Plenary session Single WG presentations of results and perspectives (WG1, WG2, WG4)
20th of May 2016	
9:30 – 13:00	Practical demonstrations in the apiary (note: each participant will bring her/his suits)
	Practical demonstration provided by each WG (e.g. data loggers application, brood removal techniques, evaluation of colony strength, powder sugar methods, etc...)
13:00 – 14:30	Lunch
14:30 – 15:30	Separated meeting within each working group to discuss protocols, results, strategies.
15:30 – 17:45	Plenary session Single WG presentations of conclusions and perspectives (WG1, WG2, WG4)
17:45 – 18:00	Task-force general conclusions
21st of May 2016	7.05 ^{am} leaves the catamaran from Unije (to Rijeka)

Oral presentations

Victoria Soroker	The effect of oxalic and formic acid treatments in Israel
Vincent Dietemann	Formic acid dispensers efficiency tests
Julien Vallon	Use of oxalic acid or formic acid (MAQS) in late spring
Michelle Taylor	Effectiveness of IPM programmes for varroa control by commercial beekeepers
Marco Pietropaoli	Icing sugar method: shaking the jar makes the difference
Michele Mortarino	Results of a WG4-FA trial in Northern Italy
Martin Gabel	Summer brood interruption for vital honey bee colonies (results and experience from a study in Germany)

Workshop summary

On 19th and 20th of May 2016 the Varroa Control COLOSS Task Force Workshop was held in Unije (Croatia).

Twenty eight participants registered for this workshop out of the 78 members listed in the Varroa Control Task Force. Considering the location of the Workshop, the number was not low.

The logistic on the island was greatly organized by Nikola Kezić, Jania Filipi, Ralph Büchler, Aleksandar Uzunov, Zlatko Puškadija and Marin Kovačić.

The workshop had a general presentation of Varroa control Task Force, given by Giovanni Formato, as Ales Gregorc was not able to take part to the event.

The workshop was divided into three sections: Plenary lectures, separate working group discussions and practical presentation at the apiary.

Separated meetings within each Working Group took place to discuss respective protocols, results, strategies and perspectives. Some participants brought to the Workshop their scientific contributions as oral presentations (see proceedings) and conclusions of each Working Group were discussed in plenary sessions.

The conclusions of the different Working Groups of the Varroa Control Task Force:

WG1 “varroa infestation assessment” (leaders Marco Pietropaoli and Ole Kilpinen): before the 12th COLOSS Conference that will be held in Romania (Cluj-Napoca, 10th-11th of September 2016), the WG will put online, on the COLOSS website, a review of the references available in the literature and the results of their activities concerning the varroa infestation assessment.

WG2 “Brood interruption” (leaders Ralph Büchler and Antonio Nanetti):

The focus of the protocols will be to study the varroa mortality in treatments of brood free colonies after caging the queens for 25 days realized with different oxalic acid applications (trickling 4,2% or 3.5%, sublimating or fogging), in association with brood removal or trapping-comb techniques (with 9-days intervals).

In few weeks, the summer brood interruption protocols will be available online on the COLOSS website, and will be sent to the other participants of the WG2 group too.

WG4 “Formic acid management” (leaders Benjamin Dainat and Giovanni Formato):

Working Group 4 COLOSS Varroa Control Task Force will contribute to enrich the database of the Varroa Wetter System to make it more accurate for the users (above all beekeepers) to know when to best apply formic acid treatments. A statistical analysis of the data obtained in the field trials realized by the different Institutes that worked according to the “short term protocol” and to the “long term protocol” will be performed in the next months. A common publication with all the Institutes that provided data will be prepared and coordinated by Vincent Dietemann and Benjamin Dainat. In a few weeks, a protocol to compare the efficacy of formic acid in presence and absence of brood (groups of minimum 6hives each) will be setup, put online on the COLOSS website and sent to other participants of the WG4 group so that they will be able to realize the summer field trials 2016. The absence of brood will change the in-hive temperature and humidity and will give the opportunity to better understand the influence of internal and external conditions on efficacy of the treatment. Evaluation of efficacy of formic acid without brood will provide baseline data for potential new application method for formic acid treatment.

Concerning the WG3 “Varroa threshold evaluation” (leaders Cecilia Costa and Per Kryger), participants decided to ask again to Cecilia for her availability to lead the WG3 now that she is back to work. Moreover, Varroa Control Task force group could implement data of the EU SMARTBEES project.

Two new Working Groups were formed:

- WG5 “Assessment of new control methods” (leader: Maja Ivana Smodis Skerl).

Activities of this new group: testing new frontiers (e.g. new products, like Aluen cap) to control *Varroa destructor*, considering the beekeepers’ priorities and realizing comparative studies.

- WG 6 “Communication” (leaders: Victoria Soroker and Flemming Vejsnaes), with activities: to communicate to beekeepers (by training, guidelines and books) and to B-RAP the output of the different Varroa Control Working Groups. Flemming Vejsnaes, being leader of the B-RAP project and of WG 6, will guarantee a strong communication/cooperation with the B-RAP project. Moreover, WG 6 should carefully listen the feedbacks obtained by the beekeepers and communicate them to the WGs leaders suggesting them new studies/ideas/corrections for future activities.

The Varroa Control Task Force will prepare a final document with all the activities so far realized, that will be presented to the COLOSS members at the 12th COLOSS Conference in Romania (Cluj-Napoca) on 10th-11th September 2016.

Practical presentation at the apiary included presentation of several techniques:

- a. Varroa sampling by icing sugar method: 1) with help of CO2 device (please provide details) (Ralph B uchler) 2) Using home made tools (Giovanni Formato).
- b. Queen caging (Ralph B uchler and Aleksandar Uzunov)
- c. Lebefeld method to estimate the strength of colonies (Aleksandar Uzunov)
- d. Brood interruption (Ralph B uchler and Aleksandar Uzunov)

The Varroa Control Task Force will prepare a final document with all the activities so far realized, that will be presented to the COLOSS members at the 12th COLOSS Conference in Romania (Cluj-Napoca) on 10th-11th September 2016.

OUTCOMES OF THE UNIJE WORKSHOP

In summary, the outcomes of the Varroa Control COLOSS Task Force Workshop held in Unije (Croatia) on 19th and 20th of May 2016, are:

- 1) WG1 “varroa infestation assessment”: before the 12th COLOSS Conference that will be held in Romania (Cluj-Napoca, 10th-11th of September 2016), they will put online, on the COLOSS website, a review of the references available in the literature and the results of their activities.
- 2) WG2 “Brood interruption”: at least, by the end of June, the summer brood interruption protocols will be available online on the COLOSS website, and will be sent to the other participants of the WG2 group.
- 3) WG3 “Varroa threshold evaluation”, Varroa Control TF leaders will ask again to Cecilia for her availability to lead the WG3 now that she is back to work.
- 4) WG4 “Formic acid management”: will contribute to enrich the database of the Varroa Wetter System to make it more accurate for the users (above all beekeepers) to know when to best apply formic acid treatments. A statistical analysis of the data obtained in the field trials realized by the different Institutes that worked according to the “short term protocol” and to the “long term protocol” will be performed in the next months. A common publication with all the Institutes that provided data will be prepared and coordinated by Vincent Dietemann and Benjamin Dainat. By the end of June, a protocol to compare the efficacy of formic acid in presence and absence of brood (groups of minimum 6hives each) will be setup, put online on the COLOSS website and sent to other participants of the WG4 group.

Two new Working Groups were formed:

- WG5 “Assessment of new control methods” (leader: Maja Ivana Smodis Skerl).
- WG 6 “Communication” (leaders: Victoria Soroker and Flemming Vejsnaes).

The Varroa Control Task Force will prepare a final document with all the activities so far realized, that will be presented to the COLOSS members at the 12th COLOSS Conference in Romania (Cluj-Napoca) on 10th-11th September 2016.

Submitted abstracts

The effect of oxalic and formic acid treatments in Israel

Ron Korkidi, Josef Kamer, Ilya Zaidman and Victoria Soroker

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Today *Varroa destructor* along with viruses it transmits poses a main threat to the Israeli apiculture. Most of the beekeepers treat their colonies against the Varroa with recommended acaricides. After failure of treatment with coumaphos loaded strips (checkmite) due to resistance development, it is now recommended to treat colonies twice a year with Amitraz impregnated sticks. The methods seems quite effective at the moment, however, there is a concern that resistance will soon follow.

We aim at development of integrated Varroa management scheme that will combine a number of approaches and will consider resistance management. As part of this effort we tested the efficacy of oxalic acid treatment with queen caging during early autumn and formic acid MAQS+ strips during winter time. The results of these trials will be presented and discussed.

Formic acid dispensers efficiency tests

Benjamin Dainat and Vincent Dietemann

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The comparison of efficiency of a range of new and older formic acid dispensers for the control of *Varroa destructor* under Swiss conditions draws to an end. The four tested dispensers had a high average efficiency against *Varroa destructor*. However, variation in efficiency was also high between the nine apiaries tested due to the large temperature and humidity differences between these sites. We will outline the results obtained to this point and discuss how to compile the data from all other teams who performed the experiment for statistical analysis as well as establish how to carry on with the work of this working group.

Use of oxalic acid or formic acid (MAQS) in late spring

Julien Vallon

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The ITSAP-Institut de l'abeille is a french organisation for extension that coordinate experiment and research in beekeeping. Involved in the UMT PrADE with the INRA in Avignon, experiments are done in regional beeyards with the network of the ADAs (Regional associations for beekeeping extension). In the bee health department, researches are focused on Varroa treatment and the test of new methods or new treatments in beekeeping real conditions.

The optimization of use of organic acids with brood removal or queen cage is experimented in some ADAs for the last years. In 2016 we get a support to test caging queens and the use of oxalic acid at the end of the season. The main lines of the protocol are: 4 experimental beeyards located in south France and 40 colonies per beeyard (4 groups of 10 hives). Queens will be locked up 25 days in Scalvini cage before oxalic acid application, using trickling or vaporization (Sublimox®). Treatment efficacy (i.e. counting dead Varroa mites during treatment and control treatment) and colonies evolution (i.e. weight, estimations of bee, brood and food quantities) will be observed in order to compare the use of homemade treatment with dihydrated oxalic acid that beekeepers used to employ still now, and Api-bioxal®, a new treatment from Chemicals Laif (Italy), recently registrated in France (2015). The experiment will be done from august to November 2016 by ADAAQ (Aquitaine), ADAM (Midi Pyrénées), ADAPro LR (Languedoc Roussillon) and ADAPi (PACA) and coordinated by ITSAP-Institut de l'abeille.

Effectiveness of IPM programmes for varroa control by commercial beekeepers

Michelle Taylor and Mark Goodwin

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Abstract: Not available

Icing sugar method: shaking the jar makes the difference

Marco Pietropaoli, Jorge Rivera Gomis, **Giovanni Formato**

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We compared two different protocols to evaluate Varroa infestation level inside honey bee colonies adopting the icing sugar technique.

The first method was the same proposed in the COLOSS Varroa Task Force Working Group 1: from one external honey frame, we took an amount of foragers bees sufficient to fill a 120ml container; we poured the bees from the 120ml container into a jar with 35g of fresh icing sugar; we closed the cap and gently rotated it with hands in 60 seconds and leaved for 3 minutes in vertical position; we shook for a couple of minutes the content of the jar (also with sidewall knock) through the screen lid and counted the number of Varroa mites.

From the same frame, we realized another sample of bees and applied the second protocol where the amount of bees and the procedure was similar and the only difference was that, after the rotation with hands of the jar, we leaved it in vertical position, cap down in order to bring down from the screen lid the Varroa mites, without shaking it.

The samples of bees, after the icing sugar methods above described, were immediately brought to the laboratory to check for the residual mites with the OIE alcohol wash method.

The percentage of mites collected with the first protocol, the same proposed in the COLOSS Varroa Task Force Working Group 1, was 95,8%±7,2%; on the contrary, the percentage of mites dislodges with the second protocol (without shaking the jar) was 69,3%±18,8%.

Results obtained from these field trials showed that shaking the jar is very important to increase the number of mites collected with the icing sugar method.

Results of a WG4-FA trial in Northern Italy

Michele Mortarino¹, Livio Colombari², Giovanni Prestini³, Elena Facchini⁴, Giovanni Formato⁵

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A field trial was performed during summer 2015 to evaluate tolerability and efficacy of liquid formic acid treatment as part of the activity of the Coloss Task Force for Varroa Control, Working Group 4. The apiary was located in the municipality of Calco, Northern Italy, in a hilly environment, around 320 mts above sea level. The experimental protocol was adapted to the Short Term Protocol designed by the WG4 (coordinators: B. Dainat and G. Formato). Three different experimental groups, each made of 6 colonies hosted in Dadant-Blatt hives, were included in the trial: group 1, treated with 60% liquid formic acid administered for 10 days using Nassenheider Evaporator Professional; group 2, treated with MAQS® formic acid strips for 7 days following the Instructions for use by the manufacturer; group 3, left untreated. Supers were not used, and external and in-hive parameters like temperature and relative humidity were recorded during the treatment using iButton dataloggers. The strength of the colonies was evaluated before the treatment. At the end of the treatment, strength were evaluated again and the queen were confined in VarControl® cages. After 22 days of caging, the queen were released and a follow up treatment was performed in all the hives by trickling oxalic acid sucrose solution. During the trial, the mite fall of each colony was recorded weekly, and adverse effects were monitored. Overall, the tolerability of the two formic acid preparations were similar, with a decrease of the amount of sealed brood compared to untreated control. One queen from the Neissenheider group was lost after the treatment. Also the effectiveness against varroa was comparable between the

two treatments, and significantly higher compared to the natural fall recorded in the untreated group.

Summer brood interruption for vital honey bee colonies (results and experience from a study in Germany)

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Brood interruption, by the methods of caging queen or brood removal, are known beekeeping methods for control Varroa destructor in honey bee colonies (*Apis mellifera* L.) in some south European regions. By using the foremost method, the beekeepers are able to force the mites in the phoretic phase in order to efficiently treat the colonies (for instance with organic acids). By the second method the beekeepers in fact remove the mites alongside with the detached sealed brood and delay following reproduction cycles of remaining mites. However, at present time we are lacking an experience and knowledge when these methods are applied as summer treatment under central European conditions.

Therefore, we investigate in our study the effect of the abovementioned methods on the colonies' overall development, health status and overwintering ability compared to the common used method in Germany (control group). The study was set up in July 2015 on an apiary near Kirchhain (central Germany) where 30 colonies were arranged into five groups. In three groups (CJ, CA, CS) we caged the queens for 25 days to treat the broodless colonies by trickling an aqueous solution of oxalic acid (3.5% m/V) afterwards. This method was applied in July (CJ), August (CA) and September (CS). In another group (BR) we removed the entire brood in July with subsequent use of a trapping-comb. The control group (FA) was treated with 60% formic acid in July following the common local practice in this region. Once per month we estimated the number of bees and brood cells with a modified "Liebefeld-method" in each colony and took bee samples to detect Varroa-infestation from July to October 2015 and in April 2016. Additional samples were taken in July, October and April to detect Nosema sp. and four viruses (CBPV, ABPV, DWV, SBV). All colonies were treated with Perizin® in January 2016 to keep the Varroa-infestation under the threshold level.

With a few exceptions, we found no difference between the treatments relating to the overwintering ability or the other parameters in July, October and April (results for Nosema sp. will be discussed on the workshop). Before wintering (October) CA showed a sig. bigger brood amount than all other groups ($p=0.001$). The Group CS showed a sig. higher Varroa-infestation in October ($p=0.018$) than FA and CA. We observed two queen losses (BR, CA) in November 2015, though, these seems to be no effect of the methods. Until now our results suggest that CJ and CA could be useful alternatives for Varroa-control under central European conditions without negative effects on the colonies. Even apart from the studied parameters, the described methods seem to be useful approaches for hive management in central Europe. They are easy to apply, efficient for Varroa-management and quick in colony multiplication at the same time.

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