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AGRICULTURE & INNOVATION



EIP-AGRI Focus Group

Bee health and sustainable beekeeping

MINIPAPER 04: Beekeeping Advising Unit. Information and training for
beekeepers.

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1. Introduction – Motivation

Beekeeping is enjoying something of a renaissance in most parts of Europe including both the professional and hobbyist sector. In some countries or regions, governments pay grants or offer financial support for motivating young people with less than one-year experience to become professional beekeepers and a few courses for several weeks. Beginner beekeepers, professional, or amateur, often struggle and lose their colonies in their first years of beekeeping. The high level of losses in bee colonies is a main issue for the economy of the whole beekeeping sector. Most member states implement a triennial national programme for the production and marketing of apiculture (total amount of € 36 million for every apiculture year over the 2017-2018 period). It is incumbent therefore that a good level of beekeepers' training/skills is also a condition for not squandering this public money.

Beekeepers have many problems to tackle and sometimes they do not find the right answer. Beekeepers need to get relevant and immediate advice from trusted official bodies as to how to manage their colonies in extreme external - environmental conditions. Information through social networks is not always true or secure. Applied research should ensure and offer practical answers to beekeepers through relevant extension service.

The objective of this minipaper is to present how to organize supporting services for beekeepers in order to improve colonies survival and colonies productivity:

- how to help to establish connection between the research, extension and beekeeping sectors
- how to respond to the needs for training and advice that beekeepers have.

This minipaper will look at 3 strands which could help the situation.

1. Formalise Beekeeping Advising and Training Centres or Units.
2. Developing a pan Europe standard of beekeeping qualification.
3. Knowledge exchange opportunities.

2. Dissertation

Beekeeping as in intensive agriculture practice depends on several internal and external influences, including honeybee colonies vitality, health, disease resistance potential and nectar foraging sources in the environment or artificial nutrition, microclimatic conditions, colony density. Honeybee colonies selection, breeding and queen rearing require highly professional approach to the sector. General beekeeping practices require permanent monitoring for colonies hygiene and disease diagnosis and control. In this regard the plethora of educational and training programmes needs to be available for small scale and professional beekeepers in order to keep productive honeybee colonies.

INFLUENCES	SCALE	CAUSES/ PROBLEMS	RESPONSIBLE ACTORS	POSSIBILITIES OF INTERVENTION/ SOLUTIONS
EXTERNAL	Global	(1) climate change and variability	Human being	+
	Regional	(2) change in land use and fragmentation of the landscape; (3) chemical exposure; (4) diseases and biological agents. (*)	Society Agricultural systems Companies Farmers Beekeepers	++
INTERNAL	Apiary	(4) diseases and biological agents. (*) (5) beekeeping practices;	Beekeeper	+++

(*) Cause 4 can also be located at apiary or regional level when there is contagion of diseases and biological agents between apiaries.

Educating beekeepers is a challenge and although many training opportunities exist, it can be difficult to bring trainer and pupil together. Hence, for a lack of basic education the renaissance is thwarted. In some institutions there are specialists for beekeeping without appropriate experiences and qualifications and their service does not reflect real needs from the sector. Therefore, advisors also need to get proper education and practice and be trained. This is also the reason why research sometimes does not respond properly to requirements from the field, or research results are not transferred into practice. Commercial and professional beekeepers also work in isolation to a large degree. They pursue their own practices handed down by elder generation or developed themselves. Most (very few) have any formal beekeeping qualifications. Given the intense nature of the active season most have minimal contact with fellow beekeeping "colleagues" so are unaware of current situation as regards recent disease outbreaks or other current matters let alone a crisis.

Beekeepers are active in a variety of environmental conditions: rural, urban and extensive agricultural. Therefore, different beekeeping technologies and practical solutions need to be pursued in order to keep healthy and productive honeybee colonies. In 2019 many beekeepers were faced with weak colonies because of severe weather conditions during spring and many colonies died. Consequently, in some areas honey production was below normal national production, self-sufficiency on honey production was drastically reduced. Due to extreme weather conditions (long periods of rain, prolonged dry periods, dearth of nectar) beekeepers need to be advised properly, how to overcome that external phenomenon in order to preserve productive colonies.

Advisers are necessary because of important differences between researchers and beekeepers. Advisers can work as link or translation between them.

DIFFERENCES	RESEARCHERS	BEEKEEPERS
They hope	Generate knowledge	Solutions and practical applications to increase production
They answer questions	Why	How, when and where
They want	Impact journals	Produce to market. Sustainable activity
They depend on	Funding, public or private	Social and economic organization and commercial structure of sector
Their time scale	years	Few weeks/months of a season

Formalise Beekeeping Advising and Training Centre/Unit

One of the supporting services to the farmers could be establishing a functional and operational Beekeeping Advising Unit that responds to the reality and needs of the sector, with the following objectives:

- Form and coordinate the Technical Assistance of Beekeepers.
- Create and update a Beekeeping Documentation Center.
- Plan and prioritize strategic R + D plans, according to the reality and necessity of the producers.
- Serve as an advisory body to the Administration.

Training of the beekeepers must be progressive and have at least three levels:

- Beginner
- Intermediate
- Advanced

Examples throughout Europe

The beekeeping centers or units receive numerous requests from researchers from universities, society in general, consumers or, social media, not only from beekeepers. Some organization and coordination is necessary to give a correct and reliable answer to these questions. Some countries as Italy, Slovenia, United Kingdom, France, Germany, Belgium, have National or Regional Centers.

In Italy, national centres of excellence for beekeeper's education and training are performed through national/regional Universities and/or Governmental institutions. A wide variety of beekeeping topics and

practices are taught; including honeybee colonies management, good beekeeping practice, hygiene in beekeeping, disease prevention, honeybee queen rearing, sustainable disease control and breeding. Certificates are issued for specific professional topic.

The National Bee Unit (NBU) in UK delivers the Bee Health Programmes on behalf of Department for Environment Food and Rural Affairs (Defra) and Welsh Government (WG) in England & Wales. It has been involved in the management and control of bee pests and diseases, along with training and dissemination of information to beekeepers for over 60 years. www.nationalbeeunit.com/index.cfm?sectionid=43

CREA - API is the Italian reference body for beekeeping. The institution was born as a result of the legislative decree 454/99 and was officially founded in 2004, when the Specialized Section for Apiculture of the ex-Experimental Institute for Agricultural Zoology was established at the National Beekeeping Institute (INA). (Isza). The institution is engaged on two main fronts: scientific research and services. <http://api.entecra.it/index.php>.

At EU level there exist the *Commission Implementing Decision (EU) 2019/974 of 12 June 2019 approving the national programmes to improve the production and marketing of apiculture products submitted by the Member States under Regulation (EU) No 1308/2013 of the European Parliament and of the Council (notified under document C(2019) 4177)*. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019D0974>

The programme starts on August 1, 2019 and ends on July 31, 2022. These programmes are designed by the member states. The measures include, for example, training for beekeepers, support to start a beekeeping business, fight against parasites that damage hives and research or measures to improve the quality of honey.

Developing a pan Europe standard of beekeeping qualification

Currently most countries have some form of beekeeping qualification. Under the proposals of this minipaper these countries programmes will be evaluated and recognized by their excellence in specific professional topics. Qualifications are considered necessary for development of contemporary beekeeping practices, to improve beekeeping techniques and knowledge exchange and extension to new beekeepers.

This minipaper proposes an accreditation facility from EU. Under these proposals at the EU level a new consortium of national experts for beekeeping excellence would be established. Their objectives are:

- to assess what is currently available in terms of beekeeping qualifications throughout Member States and rank them accordingly with a scale;
 - to establish and/or standardise nonformal beekeepers educational programmes;
 - to propose and standardise certifications issued at the national levels;
- to recognize non-governmental and independent institutions to conduct educational programmes which will have standardised levels.
- Recognised seal or stamp/logo used to give recognition and accreditation across Europe. Advantage to:
 - beekeepers as it would standardise beekeepers qualification levels.;
 - potential for landlords in future be able to check proven skills before allowing beekeepers access to their land;

- assurance for customers particularly large customers such as supermarkets assured that honey was produced by beekeepers knowledgeable and operating to the recognised standard;
- given the sometimes troublesome nature bees can cause to the public by inexperienced beekeepers a recognised beekeeping qualification should go a long way to harmonising relations;
- it would also provide assurance and qualification criteria for governments allocating public money to “trained” beekeepers (for example what criteria to apply to funds);
- to the whole beekeeping sector, it could allow a better collaboration between all stakeholders involved in beekeeping in its various forms.

Knowledge Exchange Opportunities

Existing best practices, tools, projects

Professional beekeeping organizations together with University/Gov. institutions normally organize different educational and/or extension programs for beekeepers. They organize workshops, training events, demonstrations, field trips, etc. During non-formal education programmes, they also produce variety of educational materials: books, leaflets, DVD presentations, 3D presentations, virtual demonstrations, etc. Activities are also organized not only for beekeepers, but also for general public, students in high and/or elementary schools, kindergartens, etc.

A crisis situation in Scotland surrounding heavy levels of European foulbrood in 2009 forced a radical look at developing a strategy to deal with the situation. Initially it was felt that the beekeeping sector worked well amongst itself being kept well abreast of relevant situations. However, it quickly became apparent that this was not the case. When meetings were called to outline developing plans, it was apparent that the beekeepers were initially reticent and suspicious but as time went on the barriers broke down and a true partnership was formed.

Once the disease came under control the strategy evolved to further improve the situation. Rather than simply have a meeting some became workshops dealing with bee health issues and then an accreditation developed where the beekeepers were tested against identification of disease and treatment. Success even resulted in a certificate something some had never received.

The plan has to be kept fresh and the latest is a Knowledge Transfer event where world class speakers deliver practical beekeeping knowledge to the audience. See also Annex.

In some countries, they also have apiculture museums for demonstrations of beekeeping as cultural heritage with specific themes. For example, in 2019 the Apicultural Museum in Radovljica, SLO, organized an exhibition on queen breeding and maintaining isolated mating station in high mountain areas.

There is a growing interest in bee training and advising in Europe. Research does not always translate into practical applications. Companies have served as advisors, but this advice can be unreliable. Some of the large honey producing countries have their training and technical advice programs.

Countries like Argentina with high levels of professional beekeeping have interesting projects where research, advising and rural development are well integrated.

<https://inta.gob.ar/proyectos/apicultura>

In some beekeeping regions with apicultural demonstration units they have managed to advance the productive cycle of *Apis mellifera* by two months. You can read the next manual: BEEKEEPING MANUAL for SUBTROPICAL ENVIRONMENTS which was prepared with the collaboration of the researcher, teachers and technicians that make up the School Network Team. https://inta.gob.ar/sites/default/files/inta-manual_apicultura_region_47-2.pdf

State-of-the-art of research/practice

Although the mission of universities is usually research and training of students, some universities have assumed the role of training beekeepers and extension.

Bee Lab in Minnesota University assumes the training of beekeepers through different training programs and activities: Beekeeping Classes, Beekeeping Manuals, Beekeeper Hands-on training, as [Mentoring Apiary](https://www.beelab.umn.edu/bee-squad/education/) Classes and [Home Apiary Help](https://www.beelab.umn.edu/bee-squad/education/). <https://www.beelab.umn.edu/bee-squad/education/>

Also the Beekeeping Extension and Research Laboratory of the University of Florida. <https://entnemdept.ifas.ufl.edu/honey-bee/extension/>

In Europe, CARI and RådNu can be two good examples, working both as research and advising and training units. CARI (<http://www.cari.be/t/cari/>) is a non-profit Belgian association created in June 1983 by a team of researchers from the Ecology Laboratory of the Catholic University of Louvain (UCL). CARI's missions:

1. Technical assistance to beekeepers: information - continuous training - valorization of the quality of the products of the hive - services (network of scales, analysis of honey, health follow-up, follow-up of honey, etc.)
2. Applied research related to the problems encountered in the field
3. Sector monitoring
4. Representation of beekeepers at regional, federal, European and international level
5. Public information on bees and beekeeping

The Swedish RådNu, National Competence Centre for Advisory Services (<http://bee-extension.org/about-us/>) is a regional anchored node in Västra Götaland, with the hub of SLU (Sveriges Lantbruks Universitet) in Skara. RådNu works nationally and has an international perspective. A common competence platform helps to strengthen the entire knowledge system; agricultural and rural entrepreneurs, advisors, authorities and researchers. RådNu builds a national collaborative platform and develops a new work model for how the research needs of rural areas can be captured, refined and converted into concrete research and development projects if necessary. Their goal is to become a natural partner for research and competence development in the counseling of rural and agricultural sectors. All aspects of the agricultural knowledge system need to increase their skills to achieve increased sustainability and a competitive agricultural and food sector. Effective counseling is crucial. RådNu created Bee-Extension.org as part of the Smartbees project WP 5.

Regional Centers need to be supported in terms of required profession, better equipment and problem-solving project basis. Regional centers in connection with universities can guarantee a high level of knowledge, critical mass for teaching and extension activities that ensure self-sustaining and creates further growth. These types of centers can be a source of new technologies development, immediate transfer into practice, ensure knowledge and quality of teachers for beekeepers. Beekeeping tutors are an essential component in the beekeeping sector.

One exercise would be to collect information on the economic aid or grants to beekeeping established in each country of the European Union in recent years and analyze its effect on bee health and beekeeping sustainability, especially if they were not used to advise and train.

3. Conclusions

From discussions through this Focus Group, common areas have been highlighted which would benefit from reform. For this minipaper these needs have been identified as:

1. Formalise beekeeping advising and training centres.
2. Developing a pan European standard of beekeeping education.
3. Knowledge exchange opportunities.

There is a range of standards of education available or not available to beekeepers throughout Europe. In addition, the accelerated use of social media has introduced a major risk to quality of training and mentoring. In general, social media promotes the author to expert regardless of their ability and yet those reading the material assume them to be experts.

Where the knowledge exchange opportunities exist, they are well received and achieve excellent outcomes. The willingness of those taking part, being willing to share their knowledge and experience and work practices is a major part of the secret of their success.

5. Research needs and ideas for innovations

There is a need for the standard educational material for different beekeeping professional activities and solutions. Protocols are needed for theoretical, practical courses for student, public and other interested public groups.

Further research needs coming from practice, ideas for EIP AGRI operational groups and other proposals for innovation can be found at the final report of the focus group, available at the FG webpage <https://ec.europa.eu/eip/agriculture/en/focus-groups/bee-health-and-sustainable-beekeeping>

References

1. Why Researchers Do Not Listen and Beekeepers Can Not Read Maps? Why We Are So Different and What To Do To Take Good. Author(s): José Antonio Ruiz-Martínez. Proceedings. 11th Coloss Conference, 21-23th October 2015, Lukovica, Slovenia.
2. [https://www.juntadeandalucia.es/agriculturaypesca/ifapa/cursosyjornadas/es?f\[0\]=programa:107&f\[1\]=estado:P](https://www.juntadeandalucia.es/agriculturaypesca/ifapa/cursosyjornadas/es?f[0]=programa:107&f[1]=estado:P)

Annex

A GOOD ENCOURAGING NEWS STORY FROM SCOTLAND

In 2009 Scotland faced a serious situation amongst the bee population not to mention its beekeepers. A major infestation of European foulbrood (EFB) was uncovered.

Having no surveillance or inspection programme in place the Scottish Government (SG) was relying in beekeeper notification as required in the legislation. There had only been 30 cases of American foulbrood (AFB) reported in the previous 25 years and 9 cases of EFB recorded in the previous 26 years. Overall there were 310 EFB cases and 136 AFB recorded in 2009 with many more EFB cases being dealt with by the beekeepers themselves once they knew what the disease was.

A task force was mustered bringing together up to 15 Bee Inspectors to deal with the crisis. Given the low incidence in the preceding years only one of the Inspectors had experience of dealing with EFB in the apiary. It was therefore a steep learning curve for everyone. To top it off the manager of the laboratories where sample testing took place had just left on maternity leave.

Whilst the Inspectors built up a strong team and networking with the industry, others came together under the Secretariat of the SG. Scientists, policymakers, beekeepers, statisticians and everyone we could think of was drawn into a partnership group to share their ideas of not only the problem being faced but also possible solutions. This group came together from scratch and developed many practical ideas to deal with the crisis.

Whilst the Inspectors were still assessing the scale of the infection the summer was drawing to a close. To buy time the SG arranged prescription of antibiotic and as the Inspectors couldn't get around all the affected producers a special licensing was approved allowing the affected beekeepers to undergo training and to be authorized to administer the OTC themselves albeit under SG supervision. This was to hopefully keep as many of the infected colonies alive over winter and allow the inspection program to resume the following spring. A rigorous programme of sampling the colonies the following year was also upgraded to ensure no residual antibiotic remained within the colonies.

Those observing and gauging the problem reported that the infection, given its scale, must have been present for several years. With the migratory nature of the beekeepers from spring sites to summer sites and eventually to the heather sites in the hills and then back to wintering sites having gone on for many years the practice was allowed to continue provided the statutory reporting continued.

The following year a programme of inspections continued but a training programme was also instigated. The beekeepers were trained to recognize the notifiable diseases and the protocol to follow if they suspected disease. This protocol was in essence to report the find to SG and either cull or Shook Swarm the affected colony. If Shook Swarming, the colony was moved under license to a quarantine site. Once Shook Swarmed the colony stayed in quarantine for a minimum period of 6 weeks. No colonies were allowed out of the quarantine site until certified by an Inspector to be clear of clinical signs of EFB.

The process has taken a few years, but we are now in a transformed position with all stakeholders still working well under the partnership and the infection density not eliminated but significantly reduced. Plans are still afoot to hopefully reduce the infection rates even lower.



Hopefully this report will assist others facing similarly insurmountable problems and encourage you that all is not lost. With goodwill on all sides and a fresh thinking approach, real achievements can be made allowing you to punch well above your combined weights.