A note about the SBA/COLOSS survey of beekeepers in Scotland and colony loss rates for the last three winters

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As regular readers of The Scottish Beekeeper will know, the SBA/COLOSS survey runs each year in spring, primarily with a focus on experience of colony losses over winter, however the questions also ask about wider beekeeping experience and management practices. The results are analysed at Scottish level, but data representing responses from a subset of the questions are sent for analysis together with similar data from other countries participating in the COLOSS (www.coloss.org) colony loss monitoring surveys. COLOSS is an international research association which links scientists and others who are active in studying honey bee colony losses. In 2018 there were 36 countries in total taking part in those monitoring surveys, mostly but not all in Europe. This joint analysis allows international comparison of winter loss rates. While a few areas have consistently high loss rates, in general the countries with relatively high or low loss rates differ in different years, most probably due to changing weather and other environmental factors. Scotland has been participating in the COLOSS surveys since 2010.

The questions about lost colonies ask separately about colonies that are found dead (or reduced to a few hundred bees), colonies that are lost due to unresolvable queen problems such as a drone-laying queen or no queen at all (hence a colony that is alive but unviable and which cannot be rescued), and, as of the last two years, colonies that were lost due to natural disaster (such as a flood, fire, disturbance by cattle etc). If a respondent does not answer all of these questions, for example if they do not specify a 0 if they experienced no such losses, then the total number of colonies lost cannot be calculated for that beekeeping operation and this means that we cannot include those data in the overall loss rate calculations. Even if that is the case, we can still use other data which the respondent provides, but it is important to answer all the colony loss questions as completely as possible. Additionally we ask about colonies which survive winter but are weak in spring. We calculate mortality and loss rates as the corresponding total number of colonies lost by all beekeepers as a percentage of the total number of colonies going into winter.

Some summary results for the last three winters are shown in Table 1, which shows that the number of beekeepers participating and providing all the relevant loss data has been increasing over time. The overall colony loss rate over winter has also increased to some extent in Scotland and the rates have been either higher or about the same as for all countries combined. In general the loss rate fluctuates over time, as can be seen from the results over all the countries in the COLOSS surveys. The loss rate due to natural disaster fortunately tends to be low. Losses due to queen problems are more of a concern, and for winter 2016-17 in fact were slightly more common in Scotland than dead colonies. Several beekeepers commenting to one of the authors about queen problems experienced in spring 2017 have suggested that the long wet spells of weather during the Scottish summer of 2016 resulted in many virgin queens failing to get satisfactorily mated that year and consequently more queens than usual were found to have become drone-layers in spring 2017. Earlier research from the COLOSS loss monitoring group found a significant statistical link with the chance of colony loss over winter with both the percentage of young queens in colonies before winter and the extent of queen problems in summer (van der Zee et al., 2014).

Table 1: Colony loss rates: percentage of dead colonies, percentage of colonies lost due to unresolvable queen problems and percentage of colonies lost due to natural disaster of some kind. The corresponding result for all of the countries participating in the COLOSS survey is shown in brackets beside each result for Scotland.

Winter	Number of beekeepers' supplying usable data for loss calculations	Rate (%) of mortality (percentage of dead colonies)	Rate (%) of colonies lost due to queen problems	Rate (%) of colony loss due to natural disaster	Overall winter loss rate (%) of colonies
2017-18	345 (25,363)	11.9 (10.0)	7.9 (4.8)	3.9 (1.5)	23.7 (16.4)
2016-17	336 (14,813)	9.3 (14.1)	9.7 (5.1)	1.5 (1.6)	20.4 (20.9)
2015-16	154 (19,952)	12.8 (7.6)	5.1 (4.4)	Not available	18.0 (12.0)

Extensive sets of international winter loss rates for winter 2015-16 and for winter 2016-17 are available in Brodschneider et al. (2016, 2018), while the results for winter 2017-18 (Gray et al., 2019) are in press at the time of writing.

It has become clear in at least a few countries participating in the COLOSS monitoring surveys that some of the questions asked about colony losses can cause confusion for those answering them, and so for this year's surveys a diagram has been produced that is intended to make the questions clearer. This is included here as Figure 1, which we hope will be helpful, and we will also make it available for the survey itself. This graphic was produced within the COLOSS monitoring group for use in the surveys.
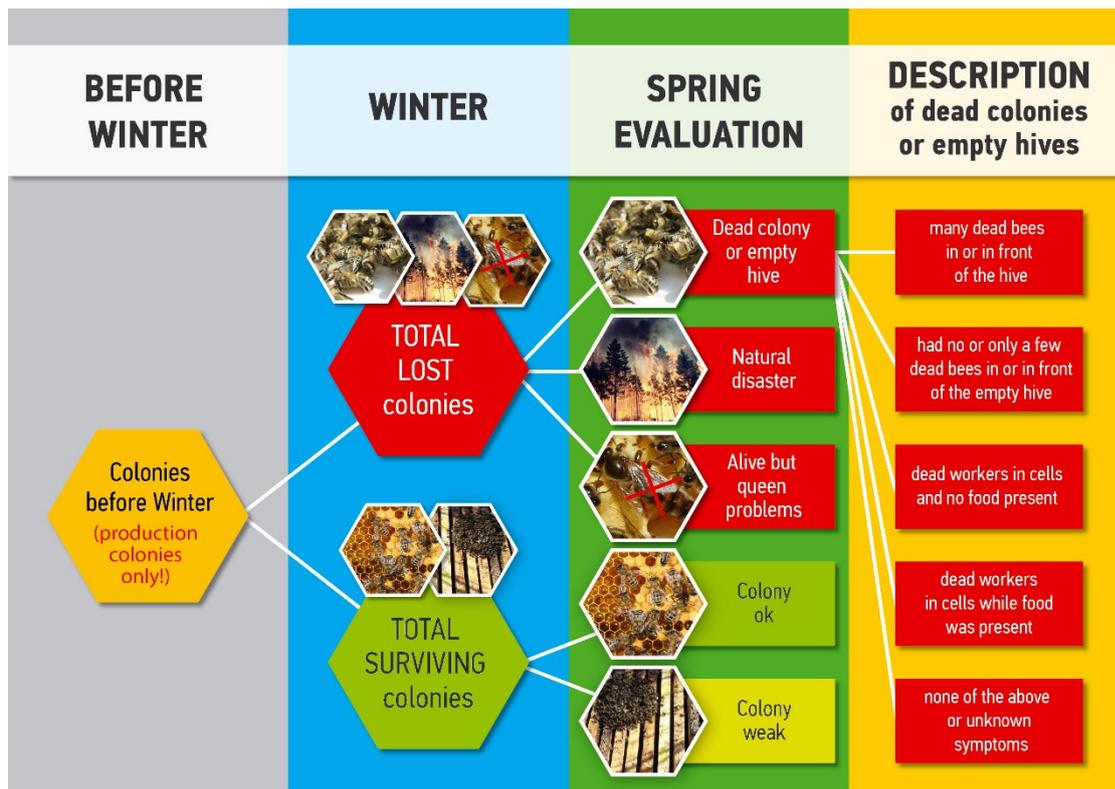
Figure 1: Graphic illustrating the logic for questions concerning lost and surviving colonies

We are very grateful to all the beekeepers who take time to answer the SBA/COLOSS survey. For those keeping reasonably careful beekeeping records, the survey should be quick to answer! Every response helps to give a fuller picture of beekeeping in Scotland. As of 2018, we have also included a few questions for new and less experienced beekeepers, and there are always a few for non-beekeepers too. We are planning for the survey, asking questions about colony losses and bee management relating to the 2018 season and winter 2018/19, to run again in late spring this year, and it should be underway at the time this article goes to press. We thank very much the SBA Development Officer for her considerable assistance in making the survey known to beekeepers in the SBA with a functioning email address. If your email has changed, please update your records with the Development Officer!

We are also very pleased to acknowledge the ongoing support of Thornes, suppliers of beekeeping equipment, who generously support the survey each year by means of a voucher for beekeeping equipment, offered to the winner of a prize draw for respondents submitting their completed questionnaire by a specified deadline. The winner is randomly drawn from those responding by that time. The winner for the survey run in 2018 lives in Fife.

References:

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