

Misusing Medicines and Substance Abuse

By Jason Learner, Ian Molyneux and Dave Bonner, NBU

Varroa management is essential to our bees' health. Here, Jason, Ian and Dave, from the NBU, emphasise the importance of using medicines to control varroa as directed – and what the consequences could be of not doing so.

The first article of this mini-series ran through all the approved veterinary medicines for the control of varroa and examined how to use them correctly. Hopefully, that article reached you just in time to be useful in helping you make an informed decision on which products would best suit your management methods for this year. In this article we look at a number of ways in which registered medicines are misused in a colony and outline how some generic and illegal methods are used to attempt to control varroa mite populations. Illegal methods can very easily lead to damaging a colony by overdosing it, leaving the colony in a worse condition than before it was treated.

Approved medicines

All of the registered medicines come with label instructions on how they should be correctly used. However, sometimes these

instructions are misunderstood, misinterpreted or simply not followed. Sometimes we adopt an attitude of 'ah, I'll take a chance; it'll be alright' and think that the worst case scenario will never happen to us or our bees. However, others consider that the worst case scenario will always pop its head around the corner and so it is wiser not to take a chance where food and residues are concerned; especially after hearing some rather shocking tales of medicines misuse, some of which are described below.

Mite Away Quick Strips (MAQS) is a formic acid-based product, which is placed on the top bars of the hive and slowly released over a seven-day period. What has made this product popular is that, at the time of writing, it is the only medicinal product which can be used during a honey flow or while honey for human consumption is in the colony. Relatively speaking, this is probably the medicine that I have received the most complaints about. The main complaints are for excessive brood loss and queen failure, which are listed as possible side-effects in the label instructions/ warnings. Often, but not in all cases, when digging a little deeper it is because the beekeeper has not given the colony adequate ventilation, which is really important when using this product, or, because they have used two strips on a colony of three to five frames of bees. The label clearly states that MAQS should not be used on a colony smaller than six frames, i.e. nothing smaller than a strong nucleus. The dose is too strong for anything smaller and will lead to colony damage or death.

Another issue is that sometimes the beekeeper has gone back a couple of days later and checked the colony. This is probably not a major issue but the label does state that the colony should be left



A mother varroa mite with three offspring. Photo by Wendy Johnston, Northern Ireland.

alone during the duration of the seven-day treatment. Possibly it has something to do with the short treatment period and that any disturbance during this period would lead to a loss of the vapours in the hive and possibly reduce the product's efficacy. In addition, any manipulation during the treatment could lead to an accidental killing of the queen and therefore if there was ever any dispute between the beekeeper and manufacturer of the product, the beekeeper would not have a leg to stand on if they had inspected the colony during the seven-day treatment period.

Apiguard is a thymol-based gel, which is stored in a foil pack and then left on the top bars for a duration of two weeks per tray. However, unlike MAQS, it cannot be used while honey for human consumption is on the hive. In the field, our inspectors have seen instances where Apiguard trays have been slid through the entrance and left on the floorboard! In such cases, especially where the monitoring board is left out of open mesh floors, it is likely that the treatment would not reach its potential 93% efficacy, because the vapours would go out of the open mesh floor and the entrance without effectively circulating within the hive. Vita advises that mesh floors should be closed using the monitoring board. This is because thymol vapours are heavier than air and with an open floor it would be expected that much of the value of the treatment may be lost. The monitoring board also serves as a useful indicator for how successful the treatment has been by allowing you to count your mite fall over the course of the treatment. The monitoring board can then be removed after the treatment has been completed. Moreover, leaving the tray on a floorboard means that the treatment is placed away from the brood where the varroa mites will be and it is placed in an area of the hive where it was not tested and so we cannot be sure what the efficacy would be.

There have also been instances where inspectors have found colonies with Apiguard in the supers where honey for human consumption is still on the hive. As stated previously, it is recommended that Apiguard is only used when supers for human consumption are not on the hive and that any honey collected during Apiguard treatment is fed back to the bees to avoid tainted honey getting into the food chain; thymol is not the tastiest of substances, even when sweetened by honey!

As a final note, some of you may have noticed that bulk buckets of Apiguard gel can no longer be purchased. This is because the Marketing Authorisation issued by the Veterinary Medicines Directorate was given only for the 50g trays and sachets, which offer a controlled dose. Using these there is very little risk of overdosing compared to using the more riskier method of 'scoop and scrape' offered with the bulk buckets.

Oxovar and Api-bioxal Api-bioxal is relatively new on the market, although its active 'ingredient', oxalic acid, has been used as a means of controlling varroa mites for some time. There are a few instances of Api-bioxal being used in an incorrect way. Firstly, a case where a beekeeper used Ambrosia sugar syrup and mixed it with Api-bioxal powder and then applied it to a colony using the trickling method. In this instance, they had measured the quantity of powder correctly and mixed it with the right measurement of syrup. However, after administering the treatment and checking the colony on a following inspection, the colony had died. In the label instructions, the method does state to use a 1:1 with sugar syrup which will leave you with thin syrup and not the thicker consistency which Ambrosia offers. The consistency may have had something to do with the death of the colony.

On occasions, beekeepers have used the whole 50ml dose on a small colony and left them 'drenched' in the oxalic acid solution. A colony only requires 5ml per seam of bees, up to 50ml. Therefore,

if there are only six seams of bees, only 30ml should be used, otherwise you risk overdosing the colony and severely damaging them.

Not using it at all. You may have heard this phrase from beekeepers "I didn't treat this winter because it was too warm". It is better to treat and kill a small amount of brood along with varroa than not to treat at all and allow the varroa mites to come through winter. In fact, in Europe, beekeepers remove frames of brood in warmer winters where brood is present and destroy them, along with the varroa inside the brood cells for that very reason.

Bayvarol/Apistan Many of you will probably have heard of this one: opening the hive to find not two strips of Apistan or four strips of Bayvarol in the brood box, but six to ten strips per brood box. Adding more strips of a pyrethroid-based medicine into the colony will not result in an increased efficacy, especially if mites are resistant to the active ingredient. In fact, it is one sure way to increase the likelihood of mites developing resistance to it; and guess what? That is exactly what has happened with the two main pyrethroid-based medicines. Yet, beekeepers still use them without carrying out a mite resistance test (the Beltsville test, which can be found in the *Managing Varroa* leaflet) and still add more than two strips per box in the hope that it will magically cure their colonies of high mite populations. Do not do it. Stick to the label instructions and make sure you know your colonies do not have pyrethroid resistant mites if you want to use these two products, or else, you will only be wasting your money.

Thymovar/Apilife var There have been few instances where these products have been used incorrectly other than when they have been used in supers. Again this goes against label instructions and it is not a smart move if you are going to be selling cut-comb honey, as residues are left behind in wax. However, one mildly amusing anecdote about Thymovar which Ian Molyneux, Northern Regional Bee Inspector, has personal experience of is that his bees chewed the wafers and dragged them out of the hive a couple of days after he put them in the hive. He has since solved this problem by pinning the wafers to the top bars. Personally, I think he has a bad case of bees behaving badly and he clearly needs to get himself some better behaved bees!

Non-approved substances

One of the problems with non-approved or generic substance use is that we have no idea how effective they are because often their mode of release is different to proven and tested substances. Usually, this mode of release is cheaper and homemade, which makes their use a bit of a gamble and can lead to residue build-up in wax and honey or lead to damaging a colony or, worse still, damage to the beekeeper. Below is a mixture of the common and a few of the obscure substances used.

Alternative pyrethroid strips

There are many 'alternative' pyrethroid-based products on the market and trying to get them removed from various online stores can be a bit of a task. However, the fight is slowly being won and fewer of them are now available. For example, have you ever seen veneer/ bamboo strips impregnated with pyrethroids or a Chinese product called 'WangManpu' or Mavrik on ebay? You probably will not now, but a couple of years ago they were being sold in abundance. Worse still, the beekeepers that were using them were not even using them correctly. It turns out that in some instances the veneer strips were being laid across the top bars of the brood chamber because there was no method to hang them between the brood frames. Remember, these types of medicines are contact strips, not fumigants. So mites need to come into contact with the active ingredient. Blocking half the strip with the top bars of frames therefore, is not a smart move.

Snake oils/essential oils

Thymol and other essential oils are used in a number of registered varroa medicines to reduce and control mite populations in a colony. When used responsibly and correctly, the products containing thymol can be very effective with efficacies reported of up to 93%. However, there are a number of ways in which beekeepers use this product not only incorrectly, but dangerously too. Does the following sound familiar, for example? A beekeeper sprinkles thymol crystals on the top bars of a couple of frames or soaks teabags in a mixture of thymol and ethanol and then leaves them on the top bars of frames. He then returns to find a trail of white crystals down the face of the brood frame with dead and aborted brood and dead bees on the floor. A week later he returns to find emergency queen cells, because, in this instance, the queen had also been killed!

Or how about this: "I'll just put a few drops of this essential oil on the floorboard." After a week the beekeeper checks the mite fall and, at a rough count, estimates around a couple of hundred mites have fallen onto the monitoring tray. Rather chuffed with himself, he goes away, believing to have killed a lot of varroa and deciding not to do anything more. Although this appears good as an initial drop, how can we be certain of the population of mites that were killed? Was it enough to get a 90% kill of the population in the colony, or, was it only a 40% kill? The problem is, we cannot be entirely sure. This is why at the NBU we stress the importance of using registered/ approved medicines which have been tested and monitored for this type of information.

Probably one of the most dangerous cases heard of by NBU staff, is the use of a vapouriser to sublime thymol crystals in the colony without the use of personal protective equipment. This is an accident waiting to happen! Thymol in its crystal form is a solid, but when it is heated it turns into a gas. When inhaled, it will very quickly revert back to its solid form and form crystals in the user's lungs. I am no doctor, but I can assure you that this is not something you would want to experience and not something beekeepers should be doing.

Varroagard

At the time of writing, Varroagard is not an approved medicine for the control of varroa but it is easy to see why most beekeepers who use this product may think that it is a safe product. If you read the item description from most suppliers of this product, you will probably be left scratching your head in confusion. The statement: "VarroaGard is a safe and easy to use powder for varroa control. Effective in reducing the count of varroa mites. Varroagard contains Virkon S, a Defra approved virucidal. It is thought that this could also provide protection in reducing the risk of foulbrood" is simply not true. It is not an approved product to use for varroa control. The only part of the statement which is true is that one of its active ingredients, Virkon S, was approved by Defra as an anti-viral in the foot and mouth outbreak; it was used to sterilise boots when entering and leaving farms. It should certainly not be used to reduce the risk of foulbrood and if being used to 'clean equipment', it should not be used while bees are present in the hive.

Frow mixture

Frow Mixture was formulated by Mr RW Frow for controlling acarine disease in the 1900s. It was sold in brown bottles and it was made up of petrol, safrol oil and nitrobenzene. Astonishingly, our inspectors are still finding little brown bottles of this stuff inside hives. Mixing a highly toxic substance such as nitrobenzene with a highly flammable chemical such as petrol is not safe, and is illegal, and it is astonishing that people still put it in their colonies.

So, as we come to the end of this article, hopefully some of you have found it interesting if nothing else; there were certainly more instances that I could have written about. This has not been written to shame anyone, but, hopefully, to make those who want to follow the law more aware of what they can and cannot do. If you would like more information about how to control varroa and the types of medicines you can use, there is a lot of information on our website: www.nationalbeeunit.com and a lot of great information in the *Managing Varroa* booklet. Also, do not forget to look out for next month's *BBKA News* where we will be exploring how one can reduce the need to use medicines by using an Integrated Pest Management (IPM) programme.

IMYB 2017 RESULTS

In third place the team with an average score per team member of 456.25 was White Caps

Facilitator: Selina Foltas, Germany
Team: Leonard Eschelboeck, Austria
Younis Bashir, England
Emilie Beq, France
Louna Alkadoum, Lebanon



In first place the team with an average score per team member of 465.5 was Brown Caps

Facilitator: Pavel Dostalík, Czech Republic
Team: Clara Hiel, Austria
Olga Skuyeva, Belarus
Vladut Stefanescu, Romania
Lana Sumi, Slovenia

In second place the team with an average score per team member of 459.4 was Red Caps

Facilitator: Emma Phair, Ireland
Team: Aliaksandr Skarakhodau, Belarus
Luis Ternes, Germany
Harriet Sweatman, Scotland
Filip Drabik, Slovakia
Karin Poljansek, Slovenia

The Individual placings were

Third place: Kamil Karasch of Germany with a score of 493
Second place: Luis Ternes of Germany with a score of 503
First place: Clara Hiel of Austria with a score of 525

You're the Bees Knees!

Are you one of the happy beekeepers in the picture opposite, who pledged to plant free seeds from Burt's Bees? If so please can you send news of your planting with some photos – ideally with the seed sign – so that we can prove we have delivered our promise?

£10,000 of free seeds were donated to the BBKA by Burt's Bees for their #Bringbackthebees campaign, and all have been distributed among BBKA members. We need to prove that we have planted, or will plant the seeds soon.

Please send your stories and/or photos to nickys@twelvepr.co.uk or george.brown@bbka.org.uk