SPRING2008

CYMDEITHAS GWENYNWYR SIR GAERFYRDDIN

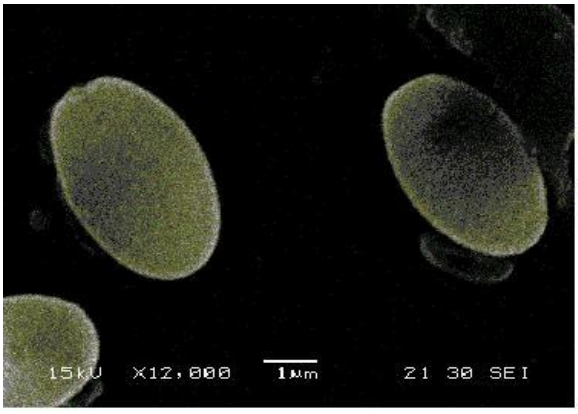
Newsletter 24

CARMARTHENSHIRE BEEKEEPERS ASSOCIATION

VOLUME 7 ISSUE 2

INSIDE THIS ISSUE

Signs of a colony suffering from dysentery Photo from http://maarec.cas.psu.edu/index.html



Spores of Nosema apis. Similar to those of Nosema ceranae
Photo from http://www.sada.org

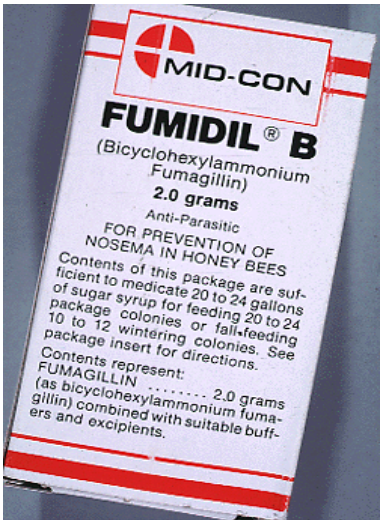


Photo from MAAREC which is a regional group focused on addressing the pest management crisis facing the beekeeping industry in the Mid-Atlantic Region. Http://maarec.cas.psu.edu/index.html

An interesting website Lots of information.

NEXT MEETINGS IN MARCH

MONDAY 3rd AT 7.30 p.m. Beginners Class 3 New Stags Head, Carmarthen talk on Choosing the right equipment by Brian Jones

THURSDAY 13th 8.00 p.m. at Llangadog with ECBKA talk on Queen Rearing using Apideas by Will Griffiths

MONDAY 17th 7.30 p.m. Beginners Class 4 New Stags Head, Carmarthen talk on Swarming by Steven Medland

SATURDAY 29th 9.00 a.m.—17.00 p.m. Welsh Beekeepers Convention at Builth Wells Royal Welsh Showground Lectures, Trade Stands Etc.

SAMPLES OF DEAD BEES FROM WALES HAVE RECENTLY BEEN FOUND TO HAVE DIED FROM *Nosema ceranae*

IF YOU HAVE LOST BEES SEND A SAMPLE TO THE NATIONAL BEE UNIT (NBU)Central Science Laboratory, National Bee Unit, Sand Hutton, North Yorkshire. YO4 1LZ Tel: 01904 462510

Nosema ceranae Kingdom Fungi, Phylum Zygomacota, Class Dihaplophasea Microsporidia, Order Dissociodihaphasida, Family Nosematidae, Genus Nosema, Species N. ceranae

Nosema ceranae is a microsporidian, a small, unicellular parasite that mainly affects *Apis cerana*, the Asiatic honey bee. It may cause nosemosis, also called nosema (see *Nosema apis*, the most widespread of the adult honey bee diseases). The dormant stage of nosema is a long-lived spore that is resistant to temperature extremes and dehydration.

Nosema ceranae was first described in 1996 and was identified as a disease of *Apis mellifera* in 2004 in Spain. Researchers in Spain have analysed samples of *Apis mellifera*, the European honey bee, mostly sent from colonies suffering unexpected decreases in bee population per hive or lower honey production, as reported by the beekeepers during the last two/three years. In 2004, 90% of some 3,000 samples had positive results for *N. ceranae*. In 2005, of 800 samples, 97% had positive results. During 2006, both France and Germany have detected the disease and recognized the genetic sequence of *Nosema ceranae* in their respective territories.

This pathogen has been tentatively linked to Colony Collapse Disorder, a phenomenon reported primarily from the United States, since fall of 2006. Highly preliminary evidence of *N. ceranae* was reported in a few hives in the Merced Valley area of California (USA). "Tests of genetic material taken from a "collapsed colony" in Merced County point to a once-rare microbe that previously affected only Asian bees but might have evolved into a strain lethal to those in Europe and the United States." The researcher did not, however, believe this was conclusive evidence of a link to CCD; "We don't want to give anybody the impression that this thing has been solved." A USDA bee scientist has similarly stated, "While the parasite nosema ceranae may be a factor, it cannot be the sole cause. The fungus has been seen before, sometimes in colonies that were healthy." Likewise, a Washington State beekeeper familiar with *N. ceranae* in his own hives discounts it as being the cause of CCD.

N. ceranae and *N. apis* have similar life cycles, but they differ in spore morphology. Spores of *N. ceranae* seem to be slightly smaller under the light microscope and the number of polar filament coils is between 20 and 23, rather than the more than 30 often seen in *N. apis*. The disease inflicts adult bees and depopulation occurs with consequent losses in honey production. ONE DOES NOT DETECT SYMPTOMS OF DIARRHEA LIKE IN *NOSEMA APIS*.

Without doubt, the most significant difference between the two types is just how quickly *N. ceranae* can cause a colony to die. BEES CAN DIE WITHIN 8 DAYS AFTER EXPOSURE TO *N. CERANAE*, WHICH IS FASTER THAN BEES EXPOSED TO *N. APIS*. The foraging force seems to be affected the most. They leave the colony and are too weak to return, thus dying in the field. This leaves behind a small cluster and a weak colony, very similar to the symptoms of CCD. There is little advice on treatment but it has been suggested that the most effective control of *Nosema ceranae* is the antibiotic fumagillin as recommended for *Nosema apis*.

Sold as FUMIDIL B from your chosen beekeeping equipment stockist.

Nosema ceranae

Giles Budge, National Bee Unit, Central Science Laboratory, York

What is Nosema ceranae and how do you test for it?

***NOSEMA CERANAE* has been termed the 'Asian variant' of a more familiar honey bee pathogen, *Nosema apis*, and was originally described in 1996. Both species are microsporidial pathogens that are thought to represent very primitive, but highly specialised parasitic fungi. Both species exist as spores which fire a tube into the cells of the honey bee gut wall. The pathogen then reproduces by injecting genetic material into cells of the gut wall and forming new spores within the host cells.**

Both *N. apis* and *N. ceranae* can be identified in adult bee samples using a standard adult disease screen. However, they are very similar when viewed using conventional microscopy, therefore species discrimination benefits from more sensitive tests. Several tests are available which focus on the detection of species-specific genetic material. CSL (Central Science Laboratory) staff have advanced these detection methods by developing a method based on real-time PCR (polymerase chain reaction), a sensitive method which can detect and quantify low levels of pathogen infection.

WHAT IS THE EUROPEAN DISTRIBUTION?

N. ceranae is already widely distributed in Europe, having been confirmed in many countries including Denmark, Finland, France, Germany, Greece, Italy, Serbia, Spain, Sweden and Switzerland. Scientists have only recently developed diagnostic tests for this pathogen so, although it looks like it has spread rapidly, it would be more accurate to say that our ability to detect it has spread rapidly.

WHAT ARE THE CLINICAL SYMPTOMS OF *N. CERANAE*?

A good description of the disease has come from a paper written in French by leading Spanish researchers:

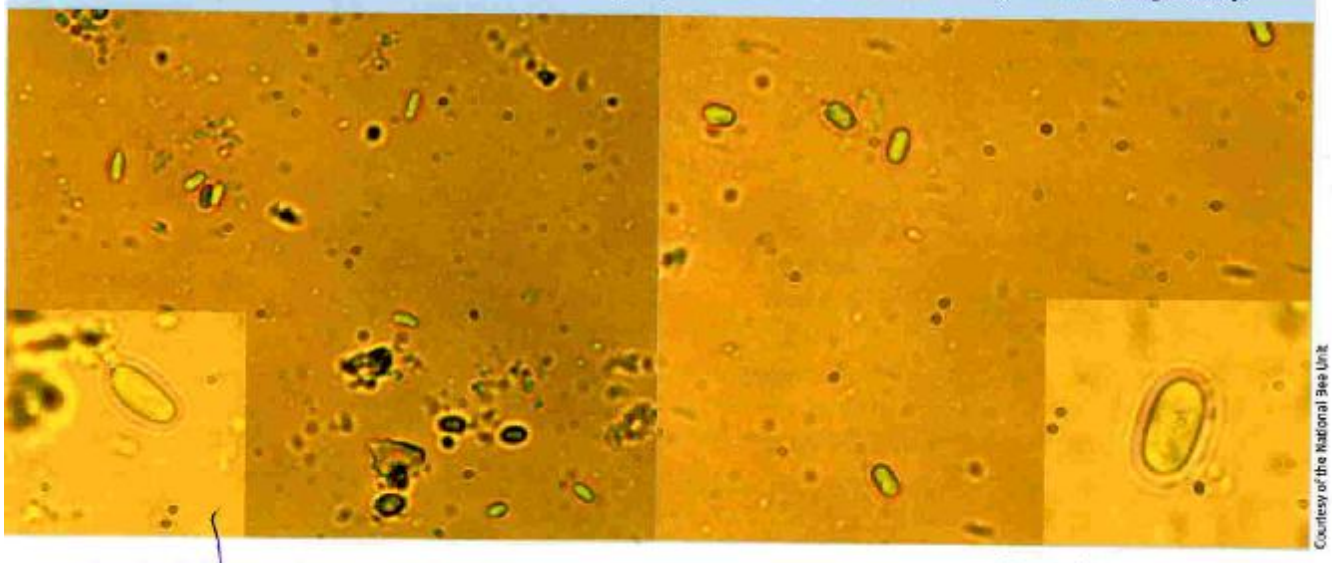
> *'What we are calling dwindling syndrome is not a new phenomenon. We first noticed losses in the late 1990s but the problem became serious in autumn/winter 2004 and spring 2005. This phenomenon is characterised by a progressive reduction in the number of bees in a colony with no apparent cause, until the point of collapse. The beekeeper may well also note a decline in colony productivity. In the final phase of this decline, secondary diseases frequently appear, including chalk brood and American foul brood. Eventually the affected colonies contain insufficient bees to carry out basic colony tasks and the colonies collapse. Mortality in front of the hives is not a frequent symptom of N. ceranae infection and there are usually no symptoms of diarrhoea or visible adult bee deaths.*

Sometimes the disease affects the whole apiary and other times only specific colonies will show symptoms. Dwindling sometimes occurs rapidly but may also occur over several months. In general, the beekeeper observes a lack of vigour and fitness of the colonies.'

DOES *N. CERANAE* EQUAL CCD?

Leading US researchers found *N. apis* to be more highly associated with CCD (Colony Collapse Disorder) than *N. ceranae*.

Nosema ceranae (left) and *Nosema apis* (right) with a single spore inset (x 400 and x 1000 magnification, respectively)



Courtesy of the National Bee Unit

N. ceranae may well be a key player in CCD. However, it is likely to be acting in concert with other pathogens or conditions.

In Europe the situation is different. Abnormal colony losses reported in Europe have been attributed to the presence of *N. ceranae*. *N. ceranae* was the reported cause of 20,000 colony losses in the Salamanca region of Spain in November 2004.

IS *N. CERANAE* IN ENGLAND AND WALES?

The National Bee Unit (NBU) started screening samples using real-time PCR assays in late November 2007, immediately after assay validation. Assay validation was delayed due to the absence of certified reference material for *N. apis* and *N. ceranae*.

In total, 309 samples have been tested for the presence of both species using real-time PCR. All positive results were confirmed using published assays for the detection of these pathogens. Positive results have therefore been confirmed using two or three methods, both based on the detection of species-specific DNA. Of these samples, 31 tested positive for *N. apis* (10%), 14 for *N. ceranae* (4.5%) and 3 (1%) tested positive for both Nosema species.

N. ceranae positives were confirmed across six counties of England (Cornwall, Essex, Lincolnshire, Hertfordshire, Greater London, North Yorkshire) and three in Wales (Glamorgan, Powys, Dyfed).

WHAT CAN YOU DO?

N. ceranae infections have been reported NOT to show typical signs of Nosema infection. For example, dysentery and crawling bees may well be absent.

It is important to note that the pathological data from Spanish apiaries are not consistent with a fast-acting, short-duration syndrome. More usually, signs of gradual depopulation, low honey production and higher autumn/winter losses are more likely indicators of the presence of this parasite.

A routine microscopic assessment will confirm infection of both Nosema species, but will not necessarily be able to distinguish between them. However, once diagnosed, treatment for *N. ceranae* is identical to that for *N. apis*. The usual veterinary medicine is equally effective against both Nosema species therefore, practically, management of the disease *N. ceranae* is the same as that described for *N. apis*. Therefore we recommend a routine adult bee disease screen for all colonies showing symptoms that cause concern and indicate possible Nosema.

Following the poor season we have all experienced as beekeepers, it is crucial that colonies entered the coming winter period in fine fettle. Your colonies need to have been well fed and other pests and diseases controlled as effectively as current treatments allow.

FUTURE RESEARCH

The NBU will carry out a more detailed survey to estimate the prevalence and impact of both Nosema species across England and Wales. As part of this process, additional samples will be collected by inspectors in the 2008 season and screened for both Nosema species. In addition, historical samples stored at the Central Science Laboratory will be tested along with imported bees. Such data will provide a better indication of geographical spread and timing of introduction.

Finally, with the permission of the beekeepers concerned, the condition of all affected colonies will be monitored.

For updates of this and other current research, please see the News and Research pages on the NBU beebase website at (http://beebase.csl.gov.uk).

Nosema Treatment – a note from the Editor

Treatment to control *Nosema apis* in a colony of bees should be two-fold: firstly by good husbandry, ie, by maintaining strong colonies with an effective system of comb renewal so that combs are as new as possible; secondly by the administration of doses of an antibiotic, fumagillin, in the autumn feed of affected colonies.

With a little training, the spore stage of Nosema can be identified. Abdomens of worker bees are ground up in a mortar with a little water and a drop of the resulting liquid spread onto a microscope slide. The tell-tale rice grain shapes can be seen using a microscope with a magnification of 400x. If you take a large enough sample of bees, you could probably detect minute levels of Nosema in many colonies. For a realistic result, it is recommended that you use around 30 bees.

Fumagillin is sold as Fumidil B. It should be mixed with the winter feed. One dose is 14 lb of sugar made into winter feed with 7 pints of water (or the approximate metric equivalent). The powder is very fine and tends to form little pellets on the surface of the syrup. It must not be added to hot water or syrup as the high temperature deactivates the antibiotic.

My advice is to make the syrup and let it cool until it feels just warm to the touch. Half fill a cup with dry sugar and add the dose of powder. Stir the two together. Add a little cool water and stir to make a paste with the sugar grains breaking up the powder globules. Add more water, a little at a time, until the powder is thoroughly mixed. Put this into the syrup and stir well. 'Wash' out the cup with some syrup and your dose is ready.

Feed so that the dose is the last food received by the colony. Last food in – first eaten is the order of the day with bees so this helps to ensure that fumagillin is present in the bees' guts throughout the winter and, more importantly, in the spring as well.

In the spring, colonies with Nosema should also be put into sterilised hives and have as many combs as possible renewed.

CONSTITUTION of the
CARMARTHENSHIRE BEEKEEPERS ASSOCIATION
CYMDEITHAS GWENYNWYR SIR GAERFYDDIN

TITLE: ---

The name of the Association shall be 'THE CARMARTHENSHIRE BEEKEEPERS ASSOCIATION' ('CYMDEITHAS GWENYNWYR SIR GAERFYDDIN'), herein referred to as 'The Association.'

OBJECTS: ---

(a) To encourage and advance beekeeping in the County of Carmarthenshire in the most recent and scientific principles.

(b) The promotion of friendly co-operation and the interchange of knowledge among beekeepers of the County and other Beekeeping Associations.

(c) The Association may hold exhibitions of Bee-keeping, Hives and Honey at such times, as they may deem suitable in the interest of the Association and its objectives. It shall adopt such measures as it believes most conducive to extend and improve a knowledge of Practical Beekeeping and the most efficient preparation and use of Bee Produce throughout the County.

CONSTITUTION: ---

The Association shall consist of President, Vice-Presidents, Patrons, Life Members and Members.

The position of President and Vice President shall be honorary posts. Election to these positions shall be decided at the Annual General Meeting

SUBSCRIPTIONS: ---

Donors of £200 and upwards shall be Life Members and shall be entitled to the benefits of an Annual Member.

Life members may also be elected by the Association as recognition for special services to the Association over a number of years.

Annual subscriptions for members of the Association shall be fixed by the Committee and shall be submitted to the Annual General Meeting for its approval. All subscriptions shall be payable in advance and shall become due as soon as practical after the Annual General Meeting in each year and until such subscriptions be paid no members shall be entitled to the privileges of the Association.

Family members can be included with a member's annual subscription but will not be entitled to vote unless they join as a member in their own right. Family members will not be entitled to extra copies of The Welsh Beekeeper or Carmarthenshire Beekeepers Newsletters.

Junior members fees will cover BDI insurance and Capitation fees to the Welsh Beekeepers Association only.

MANAGEMENT: ---

The Annual General Meeting shall be held as early as possible in the year, at which there shall be elected a President, Vice President, Secretary and Treasurer, who shall be ex-officio members of the Committee. It shall also elect its Chairman, Vice-Chairman, delegates to the Welsh Beekeepers Association, Apiary Manager, Minutes Secretary and Librarian and at least two other Committee Members

(b) The management of the Association shall be vested in the Committee, five to form a Quorum, consisting of the Hon. Secretary, and Treasurer and three other Committee members.

The Committee shall submit an Annual Report and Statement of Accounts to the Annual General Meeting, and the Secretary shall cause a copy thereof to be sent to each member of the Association, together with the Agenda of the business to be transacted at the Annual General Meeting including any proposed alteration of the Rules at least six days prior to such meeting.

The Committee shall be responsible for the policy, conduct and management of the Association, and shall control the Association's Finances, Insurances and Affiliations. It shall maintain its active co-operation with the Carmarthenshire

Local Education Authority. It shall also co-operate with the Welsh Assembly in carrying out the provisions of any official bee legislation.

The Committee shall meet at least twice a year and at such times the Chairman and Secretary may deem as necessary. Travelling expenses of Committee Members, or any Sub-Committee appointed by the Committee, shall be paid at the discretion of the Association, if claimed.

All propositions at any meeting shall be disposed of by a show of hands, but a ballot may be demanded by any three members present.

GENERAL: ---

All monies and effects shall be the property of the Carmarthenshire Beekeepers Association.

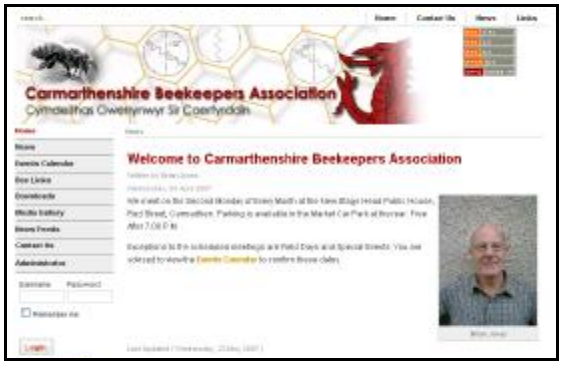
The Committee shall be empowered to decline the application of any person for membership.

The Committee's decision on all matters shall be final, and binding.

In the event of the dissolution of the Association all monies and assets shall be donated to another Beekeeping Association.

This copy of the Constitution has been revised from information discussed at the Annual General Meeting held on the 7th January 2008 and further amended and approved at a committee meeting held on 5th February 2008

Brian Jones (Honorary Secretary Carmarthenshire Beekeepers Association)



CARMARTHENSHIRE BEEKEEPERS WEBSITE ADDRESS IS
www.carmarthenshirebeekeepers.org.uk

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