

Good Practices

in Bee Health



Looking after bees

APICOMÍN



Introduction:

From the moment that a beekeeper takes care of beehives he also acquires the commitment to try to get along and tending them in order to maintain a relationship of mutual benefit.

On the one hand the bees will be forced to increase their productivity. You not only have to collect the necessary for survival, but have to add to that amount which the beekeeper believes his crop.

On the other hand, the beekeeper must provide them with the necessary care to ensure that their bees survive, despite their exploitation.

Some things to consider:

- ◊ Find them a good place to life.
- ◊ Leave them enough reserves after harvesting or in times of scarcity, feed them.
- ◊ Keep them in hygienic conditions - adequate sanitation.

In natural conditions bees are subject to attack by a number of enemies and diseases, which hardly prosper beyond few colonies, mainly due to their isolation. On apiaries we maintain unnatural concentrations (but profitable) hives and perform certain management operations that can unbalance the bee colony, thus causing the appearance of most diseases and dissemination.

The purpose of these pages is to help establish best practices in hygienic handling bees, so that the risk of diseases in our apiaries is minimal, we know quickly to detect the causes of health problems, and we can raise corrective actions that do not degrade the high quality of the bee products. Under no circumstances is to lose sight of the need for quality of the current market, the consumer cannot receive a product deteriorated by residues caused by careless action.

Appearance of diseases

Many of the diseases are dormant in most of the colonies, and will only develop provided:

- There are genetic deficiencies in the inheritance of the bees that impede the efficient operation of its individual defense systems (production of antimicrobial peptides ...).
- There are genetic deficiencies in the inheritance of the bees that impede the efficient operation of collective defense systems of the colony (Hygienic behavior against foulbrood and chalk brood; specific hygiene against varroa...).
- If internal colony conditions or environment so hostile that prevent vital conservation of bees, and therefore the swarm (lack of nutrients, very unfavorable weather, old queen, bad management ...).

Each hive, as each animal or each individual responds differently to the danger of disease (flowering, but also beekeeper management ...). Its response to these danger colonies can be divided into three groups:

- Vigorous colonies, with strong hereditary mechanisms, genetic, defense, allowing them to avoid falling into the disease.
- Colonies falling in the disease when they are at a disadvantage (unfavorable weather, population imbalance / brood per colony or other causes, improper handling ...), but can be helped by the beekeeper to overcome this setback.
- Finally, colonies with defective health behaviors, inadequate for the operating system, which, in natural conditions, just survive, and only thanks to the beekeepers care maintain alive, though unproductive.

As beekeepers we must act avoiding risk situations of our hives, as producers cannot keep colonies falling ill and whose production is the need for care. If our actions are successful it is essential to have the right knowledge to enable us to identify risks, evaluate, and act according to the circumstances.

In the pages that will follow a review of the key risk factors in the apiaries and hope it will be profitable.

Syndrome of colony disappearance

Lately, since late 2004, there is an increased mortality of fall- winter hives, some years more than others, apparently without a clear cause. It is what is being called Colony Disappearance Syndrome, (in the U.S. is called CCD: Colony Collapse Disorder). Before we start with diseases with clear causal agent we will review this issue first.

There is some variability in symptoms, but the most common are that the hives coming of autumn usually stop breeding, and lose in population gradually, more sharply when the cold starts in areas where they are, and end up with a bunch of bees and queen and full of honey, rarely have good stock of pollen, sometimes remain a small amount of dotted brood.

Often these problems are present in the vast majority of hives in the same apiary (which has followed the same path and have same foraging territories), while other nearby apiaries, of the same beekeeper, with the same management, do not manifest. The losses of hives can become really important.

The general opinion is that there are several causes that together can produce this situation. The main or more generally, are:

- Poor nutrition by unfavorable weather.
- High presence of Varroa.
- Residues of pesticides (internal, acaricides used against Varroa, external and agricultural) but also in wax and pollen.

When a hive is weakened by the combination of these three factors, each of which may, individually, be more or less important, the bees are perishing for weakness, intoxication or development of diseases which were dormant and diminish the defenses to manifest itself (Nosema) Sometimes one of these factors is sufficiently important to cause the disappearance alone, sometimes two, or all three, can be the causative factors.

Poor nutrition by unfavorable weather

Bees live 800 km that means working in times live about a month and a half (12 trips per day x 2km / trip). But those born in fall have to survive 3 or 4 months and hold out until spring. Therefore for beehives food is very important in autumn, which has enough offspring production of bees and these bees are to have sufficient force. This importance is even greater if the hives did not eat properly in the summer, which is usually relatively common in most of the Spanish territory.

The climate undergoes periodic variations. In some areas the migratory path of bee-eaters (*Merops apiaster*) on his flight back to Africa, in September, increases the effect of food deprivation. When they are present bees do not leave the nest, they just make some flights late in the afternoon mainly to collect water.

This fall period with low pollen collection (accentuated in flowering like lavender or oak honeydew "mela") ends up with a beehive with little or no premature brood, old bees only unable to hold all winter, with lots of honey and little or no pollen.

Under these conditions, when the first frosts come, the hive can lose between 2 and 4 frames of bees and fall below the critical mass needed to survive. This process can take 2-3 months. If at that time hives are not visited often its evolution can go unnoticed and the beehive goes from "normal" to "terminal", depopulated and dye.

Actions:

The solution to this problem is moving the hives to a flowering source with good pollen, or feeding them APICOMæN and / or a product rich in protein, vitamins and amino acids APIMIDA / APIMIDA CONCENTRATED, feed with large pollen nutrients.



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Foulbrood

FOULBROOD: The foulbrood is a disease caused by bacteria, which attack to the brood of the bees causing their putrefaction. There are two types of foulbrood, European foulbrood and American foulbrood, the latter more serious and dangerous. While there are clear differences between them, sometimes they may occur together, masking the symptoms.

AMERICAN FOUL BROOD: American foulbrood is caused by the bacterium *Paenibacillus larvae*, which spreads to the young larvae by the food given by adult bees. Appears when the larvae spend a period of hunger or cold.

It develops slowly, the infected larvae may enter into enclosure, given time, although die after the cell is sealed. These dead pupas are removed by the bees more or less rapidly and with some level of efficiency. Cleaned brood cells by the bees give the "punctuated" appearance with empty cells amid closed cells.

Appearance of the affected colony:

- Dotted capped brood (caused by dead and removed larvae).
- Sunken cell cappings, cracked, punctured, usually a rotten smell (The cell cappings of colonies with European foulbrood are normal and larvae inside are alive).
- When removing rotten pupa with a stick, stretched over 2.5 cm (European foulbrood does not stretch).
- Strong rotten odor (in European foulbrood there is no foul smell, is more like Fermentation).

American foulbrood is very serious, affects rapidly the colonies, contaminating from one to the other within the same apiary, eliminating the weaker colonies completely relatively quickly.

It is difficult finding a cure by changing queens or favorable weather conditions. A more energetic intervention is required.

EUROPEAN FOULBROOD: European foulbrood is caused by a group of bacteria, *Streptococcus pluton* / *Melissococcus pluton*, and other secondary bacteria. The disease can be developed when the brood suffers from stress and weakens. It grows quickly, and the larvae die before closure of the cells. Failures of dead larvae also give the brood comb a "peppered" appearance with empty cells next to brood areas.

Usually occurs associated with Varroa. Disappears when it is controlled and there is favorable weather and flowering conditions.

Actions: The brood of affected colonies should be eliminated. Disinfect the affected hives and above all, the bottom boards of the boxes.

Laboratory and field work have shown efficacy in the biological treatment using extracts of some vegetable oils rich in BIOFLAVONOIDES with antibiotic activity against American Foulbrood bacteria. When the disease is diagnosed should apply these bioflavonoids, present in the NEO APICICLINE, all the colonies of the apiary.



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NOSEMA:

Description and development conditions:

Nosema is a disease caused by microorganisms of the genus Nosema. They affect the intestines of the bees. Previously classified as protozoa and lately like fungi. Until 1996 it was considered that there was only one species. *Apis nosema*, which was identified by microscopic observation, but the development of molecular analytical techniques, DNA, leading to the conclusion that spores were seen as equal under the microscope actually belonged two different nosema species, *Nosema apis* in European bees, and a new, described to the Asian bee but is now worldwide, *Nosema ceranae*.

Nosema spores exist in small quantities in most of the normal hives. When the spores are ingested by healthy bees, it passes to the large intestines and is fixed on the inner tissue where it reproduces, forming more spores, develops by feeding of this tissue, destroying it in the process. This causes a decrease in size of the abdomen, mortality on house bees, and, at times, dark stretchy spots of excrement on the frames and top of the hive.

Other times there are these external indicators of the disease, and only observe a decrease in the population of adult bees from the hive, until you get to an amount below the critical level of survival, leaving only the queen and a small group of bees eventually die of cold overnight. These symptoms match those of malnutrition due to lack of pollen.

When the process is severe, colonies die quickly if not treated conveniently.

Actions:

Eliminate dead bees from the entrances, clean and disinfect at least the hives bottoms. Activates cleaning instinct of bees with NEO-NOSAPIOL.



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MITES:

Varroa : *Varroa destructor*, is the biggest problem of our current beekeeping. Not only for the damage caused in brood and adult bees, but also by weakening and physical damage with his bite are causing the gateway and development for other pests.

Recent work in several countries (Germany, France, Italy, USA ...), Spain among them, (Orantes 2010), is being established that in some bees waxes are high residue levels. We are continuously using acaricides against Varroa (in Spain since 1986), these residues accumulates, as soluble fats, in the waxcells and pollen stored therein, causing poisoning in larvae and facilitating the development of the diseases (foulbrood, mycosis nosema ...).

The continuing fight against Varroa has led to the emergence of resistance to a series of acaricides, which have had to be replaced by others as this mite was "learning" to develop resistance, which is pretty good prepared. Since 1994 have been appearing Varroa populations resistant for acaricides.

BIOLOGICAL TREATMENT (ALTERNATIVE):

There are varroa control treatments involving one with natural substances potentially not dangerous for its residues. Of these the most used is THYMOL is currently present in the scents of thyme (*Thymes spp*) and other plants of this group, and used as acaricide since ancient times.



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Micosis, chalkbrood:

MICOSIS, CHALKBROOD:

Chalkbrood is a fungus, *Ascosphaera apis*, which develops in the brood, killing the pupae. It is present in most of the hives, but usually only appears when the hive suffers significant stress. Meaning a delay in the development of newly capped brood (by poor diet, sudden unfavorable weather conditions or loss of bees by intoxication, swarming, migration to colder areas, bad management ...)

If the beehive has good hygienic behavior it may be able to cleanup the mummies and stay alive for some time, if not eventually dies within a variable period (mostly within a year). If the weather and flowering conditions become favorable, the hives can change the queen, and if she turns out to be of good genetics regarding hygienic behavior, the beehive changes and is saved. No chemical treatment for colonies will cure this disease.

Performances:

Affected brood should be removed. Clean and disinfect at least the bottom board of the hive, and ensure that the young brood does not go hungry or cold (covering the brood area with farming plastic, blocking vents ...) till improved weather. Application of a rather thick syrup, or solid food (NEO APICYCLINA) can activate the cleaning instinct and help expel the mummies from the colony and become healthy again.



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WAX MOTH:

The wax moth (*Galleria mellonella*), is a butterfly whose larvae destroy combs stored in the hives while looking for food in stored pollen or protein with which bee larvae spin their cocoons. Normally maintained under control by the bees, only when a hive is weakened or dead it may thrive.

Females mated moths are laying hundreds of eggs in fissures of the beehives or elsewhere inaccessible to the cleaning actions of the bees. Temperature and high humidity favors the emergence eggs, it takes eight to ten days between 30 and 32° C. At low temperatures hatching of the eggs can delay for several months. The larvae tunnels through the comb protected by its silk filaments, spin a cocoon and transforms into adults. The combination of the damage and the filament prevents the proper use of honeycombs by the bees and if the hive is weak can go cornering her until its death.

Actions:

The best way to combat wax moth is always having hives well populous, strong, healthy and with good food reserves. In warm periods, with high wax moth activity, combs containing pollen should not be left anywhere, or have served to raise brood, within its reach.

The frames, both in store as well as the beehive cannot cover and defend, can be protected with CERAPOL. This is prepared for biological control based on spores of a microorganism, harmless to bees and people. When ingested by moth larvae develop in their gut, destroying their digestive tract and causing death.



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CERAPOL®

TREATAMIENTO BIOLÓGICO

Saccharopolyspora saccharosa, 10 x10¹⁰g - millones de Unidades Internacionales por gramo.
Poco soluble.

Protege de las parásitos de cara almacenamiento, pero también la propia de la cara (diferente naturaleza)

INDICACIONES DE USO:

Añadir a los 20 g del contenido de este sobre 2 litros de agua, luego dejarlo actuar unas 48 horas para hacer y pulverizar finalmente los panales. Aplicarlo inmediatamente para mantener la temperatura, y aplicarlo entre 14 a.s. por cada cara del panel. Aplicarlo en lugar fresco, seco y al abrigo de la luz.

El contenido suficiente para 20 panales.

Cuando los panales de arriba comienzan a caer así protegido impedir las esporas de este Sacchar, que se acumulan en su interior descomponiéndolo y provocando su muerte. Estas esporas son dañinas para todos los tipos de apicultura, incluso para otros animales y personas.

El contenido de este sobre permite proteger entre 75 panales

USO DE ALMACÉN



CERAPOL®

W122 - Monocultivo

C. 02 - 4000 75 - 1

INDICACIONES: Saccharopolyspora saccharosa (10¹⁰) x 10¹⁰g

CONTENIDO: 20 GRAMOS - Esporas vivas: 2000 mg (10¹⁰) Panes de agua

INDICACIONES: 10000 COLONIAS - 10¹⁰

INDICACIONES: 10000 COLONIAS - 10¹⁰

Contenido: 20 gr.

Protege de la luz y de la humedad.

Ahor Ingersol S.L.

Poligono Industrial Las Valeras

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48100 MONTEBAYO, Vizcaya, España.

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FORMA DE CREACIÓN

Abejar Swarm Attractant

When a bee colony reaches maturity, it tends to divide and colonize new settlements. How? Sending a swarm formed by a portion of their bees and a queen.

Swarms have scout bees, which are responsible for finding a new cavity where the colony can be installed. These bees, at times days before leaving, and sometimes when the swarm is perched on any branch or similar visit nearby cavities and return to swarm to indicate the position by their dance language. Good cavities greatly stimulate the scouts, making them to dance more and establishing its position to the other bees, which then fly directly to their new home.

ABEJAR is an extract of natural plant essences highly attractive to bees in oily substance to support for a slow evaporation and lasts longer. Its objective is to attract scout bees to the hives impregnated with ABEJAR, facilitating the entry of the swarms.



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Field diagnosis of principle bee diseases

| Symptoms at hive entrance | |
|---|--|
| <ul style="list-style-type: none"> Fast diminuation of the brood and the quantity of bees, only a few remain with the queen | <ul style="list-style-type: none"> ◇ DISAPPEARANCE: control pollen reserves, feeding a pollen supplement if there is a shortage or lack of variety in the hive, using light feeds that bees can consume, place it on top covered with some lastic so it is heated by the bees; review for varroa, treat if present, analyze residues in wax, analyze bees for nosema. |
| <ul style="list-style-type: none"> Abnormal high number of dead bees | <p>Bees with swollen abdomen that do not fly:</p> <ul style="list-style-type: none"> √ Smelly brown spots on hive entrance, interior and upper hive boxes. Sometimes without stain. Dissect large intestines: Nosema <p>The dead bees are foragers (pollen on rear legs), stretched tongues:</p> <ul style="list-style-type: none"> √ PESTICIDE POISONING, Early or late flowering (almond or strawberry) and low temperatures: COLD |
| <ul style="list-style-type: none"> Some dead bees, Some live bees are shiny black and hairless, difficulty of movement with hind legs, others attack and prevent bees entering the hive: BLACK BEES (acute paralysis: APV = acute paralysis virus, chronic paralysis: CPV = chronic paralysis virus) If, in addition, there is varroa, when these bite affected bees and then to the larvae transmits paralysis virus (APV, CPV) and a part of the pupas die, giving a peppered appearance. | |
| <ul style="list-style-type: none"> Some workers with reduced abdomens, wings crumpled, peppered brood, dead varroa on the bottom of the hive: VARROA | |
| <ul style="list-style-type: none"> Particles of wax | <ul style="list-style-type: none"> ◇ From dark wax, path from grass to the hive: MOUSE (reduce entrance) ◇ From clear wax, honey cells empty and gnawed edge: PLUNDER (reduce entrance) |
| <ul style="list-style-type: none"> Worker larvae | <ul style="list-style-type: none"> ◇ Mumified, whitish or black: chalk brood ◇ Apparently healthy √ Quick drop of temperature : COLD √ Cleaning instinct against varroa, sometimes you note them in the corner, (if absent of ants) : VARROA |

Field diagnosis of principle diseases of honeybees

| Symptoms in brood: | |
|--|---|
| <ul style="list-style-type: none"> ◊ Most dead brood is capped, sunken cappings, cracked, punctured, brown rotten brood, when removed with a twig or blade stretches more than 2.5 cm, rotten smell: <p style="text-align: center;">AMERICAN FOULBROOD</p> | <ul style="list-style-type: none"> ◊ Most dead brood is open, light brown, removed as a lump, not stretched to the 2 - 2,5 cm, not smelly: <p style="text-align: center;">EUROPEAN FOULBROOD</p> |
| <ul style="list-style-type: none"> • Scattered brood | <ul style="list-style-type: none"> ◊ Mummies white or / and black, especially in the cells of the last brood comb cold side of the hive, in the lower parts of the frames and bottom of the hive : <p style="text-align: center;">CHALC BROOD</p> |
| <ul style="list-style-type: none"> • Multiple egg-laying | <ul style="list-style-type: none"> ◊ Bees reduced abdomen, sometimes diminished wings and / or wrinkled; in open cells varroacan be seen , more often in the most advanced worker cells, especially in the drone: <p style="text-align: center;">VARROA</p> |
| <ul style="list-style-type: none"> ◊ Multiple egg-laying of several eggs in the same cell, only born drones working even in cells: <p style="text-align: center;">DRONE LAYING QUEEN</p> | <ul style="list-style-type: none"> ◊ Deposit of various eggs in the same cell √ Disappears without doing anything within a week : NEW QUEEN √ It maintains, only drones are born including in worker cells, DRONE LAYING QUEEN |

KESSLER IBERIACA laboratories also provides the market with the following products and their uses:

SWARM ATTRACTANT “ABEJAR” SOLID: (hunting swarms) Product used for catching bee swarms.

SWARM ATTRACTANT “ABEJAR” SPRAY: (hunting swarms) Product in spray form used for catching bee swarms.

THYMOL: Biological product, powder (Varroa treatment).

CERAPOL: Biological product to combat the larvae of the wax moth. Effectively protects wax moths attack.

APICOMÍN: Syrup / special vitamins and exclusive to bees. Food security in times of scarcity of honey and pollen.

APIMIDA: Food to stimulate queen laying and the development of brood.

APIMIDA CONCENTRATED: Concentrated protein, amino acids and vitamins for preparing syrups and patties when there is a shortage of pollen, (Packs of 1 and 5 liters).

APICYCLINA: Food enriched with vitamins, powder for bees and their brood.

NEO APICYCLINA: (Powder) with bioflavonoids, very efficient in the treatment biological bacteria against European and American foulbrood.

APICYCLINA LIQUID: with bioflavonoids, vegetable concentrate for feed preparation, syrups and patties for the treatment against European and American foulbrood bacteria.

NOSAPIOL: Concentrated preparation for a digestive syrup to support bees in periods of bad weather.

NEO NOSAPIOL: With plant extract, activates the gut defenses In order to prevent intestinal disorders.

APIMIDA CONCENTRADA





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