Report on beekeeping in the Netherlands

1 Climate

Honeybees in the Netherlands live in a moderate maritime climate. This means that the summers are cool and the winters are mild. Because the Netherlands is on a dividing line of the western airstreams coming from the sea and eastern airstreams coming from the European mainland, the weather patterns are strongly fluctuating in all seasons. The weather is highly unpredictable with rainfall throughout the year. On average precipitation occurs 7,6% of the time, be it as rainfall, hail, snow or fog. Below are two long term averages that give a good impression of the circumstances in the Netherlands.

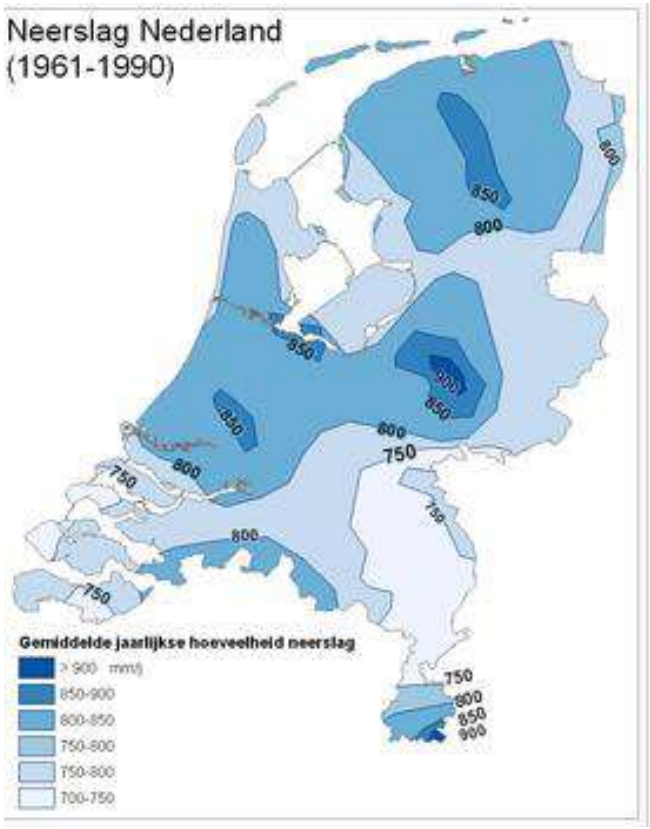
The graph shows resp. Average highest; average lowest extremes; average temperature, average amount of rain and average sun hours during each month.

The map shows the regional rainfall that, as you can see, varies substantially in some areas. Although we have a flat country, there are some landmarks which influence the weather. Rivers, lakes and forest play a big role, but even the main soil in an area has an influence.

Langjarige gemiddelden en extremen, tijdvak 1981 - 2010, De Bilt[1]

Maand	jan	feb	mar	apr	mei	jun	jul	aug	sep	okt	nov	dec	Jaar
Gem. hoogste temp. (°C)	**5,6**	6,4	10,0	14,0	18,0	20,4	**22,8**	22,6	19,1	14,6	9,6	6,1	14,1
Gem. laagste temp. (°C)	0,3	**0,2**	2,3	4,1	7,8	10,5	**12,8**	12,3	9,9	6,9	3,6	1,0	6,0
Gem. temp. (°C)	**3,1**	3,3	6,2	9,2	13,1	15,6	**17,9**	17,5	14,5	10,7	6,7	3,7	10,1
Gem. neerslag (mm)	69,6	55,8	66,8	**42,3**	61,9	65,6	81,1	72,9	78,1	**82,8**	79,8	75,8	832,5
Gem. aantal uren zon	62,3	85,7	121,6	173,6	193,9	**207,2**	206,0	187,7	138,3	112,9	63,0	**49,3**	1601,6

These long term averages give a reliable view of the Dutch climate. But depending on the main direction of the wind, be it in summer or winter, extreme deviations from the averages can occur. These extremes are mostly short term. The highest temperature ever recorded in the Netherlands was 38.6 degrees Celsius and the coldest temperature -27.4 degrees Celsius. (101.5 °F, -17.3 °F)



2 The Nectar flows

The Netherlands has, besides urban areas, a relative high percentage of the land in use for agriculture and cattle breeding. The landscape has a lot of unnatural grasslands, meadows, that have little to offer to the bees due to prolonged and intensive use of herbicides and weed killing pesticides.

Dutch agriculture is dominated by medium sized monocultures.

In the eastern and mid part of the country, one can still find somewhat compact forested areas and large areas of heathland.

The coastal area with the dunes and nature reserves behind it, consists of poor soil that is lightly managed. Here the flora can be very interesting for the bees.

Late winter is mostly the coldest period in the Netherlands. Cold, windy days with only a few hours of sunlight, keep the bees mostly inside their hives. The slow build-up of the broodnest starts on average in January and strongly draws on the winter stores of the hive.

As soon as the sunlight gains strength, the spring nectar flow starts with indigenous species like the Willow tree, Chestnut, Dandelions and flowers from the Ranunculus family, followed by different fruit trees like the Apple, Pear, Cherry and plum and by the early crop species like rapeseed (*Brassica napus)*.

In the urban regions the natural nectar flows are supplemented by different cultivated plants in private gardens and parks. Bulbous and tuberous plants mostly be the first to bring us the colours of spring.

The summer nectar flow consists of flowers from species like the Lime tree *(Tilia europaea)*, Buckthorn *(Rhamnus)*, Mustard *(sinapis alba),* Phacelia *(Phacelia tanacetifolia),* Alfalfa *(Medicago Sativa),* Hogweed *(Heracleum sphondylium)*, Bramble *(Rubus fruticosus)* and Heather *(Ericaceae).*

The autumn nectar flow is mainly supplied by plants like Hedera helix, Aster *(Aster ageratoides)*, Eupatorium cannabinum, Balsam *(Impatiens glandulifera)*, wild Rocket *(Eruca sativa)* etc..

Where the summer flowers in most countries bring a strong summer nectar flow, this in by no means the case in the Netherlands. As soon as wind from the east comes over the country, a summer drought might occur. Resulting in flowering plants, trees and bushes not being able to produce nectar due to the lack of water.

Beside the summer droughts, our bees have to deal with very distinct breaks in between the main nectar flows. Up to some dozens years ago, the bees always relied on the intermediate small and scattered nectar flows they found in the small scale rural areas with their characteristic sandy paths, wooded banks, hedges and natural grasslands. The flowering herbs growing in these places have almost disappeared nowadays. A break in the nectar flow, is for the honeybee a period of lack and hunger, wherein the bees sometimes use all of their careful built-up precious stores. A break in the

nectar flow can also occur by chemical weed killing and mowing flowers at the wrong moment (photo: summer 2016 / emptied honeycombs).

The nectar flows in the Netherlands are locally so incredibly poor that, in many places, the bees are no longer able to support themselves. The beekeepers often support their bees a few times a year by the feeding of sugar water. For the lack of pollen there is no substitute.

It is a very sad finding, that in the Netherlands, the urban areas produce a more reliable nectar flow than all of the surrounding nature and rural areas. On a very large scale, mankind transformed the surface of the land into a desert for bees.

3 Beekeeper Organisations

The Dutch beekeepers organisation, the Nederlandse Bijenhoudersvereniging (NBV), is a nationwide coordinating body that is segmented into 17 regional groups.

The NBV consists of local/regional departments: Over 200 in total.

The members of the NBV – over 6,000 –have a membership of the nationwide organisation as well a membership of their local department. All the local departments came from the mother-organisation or joined the mother organisation.

There is an estimate of 2,000 beekeepers, not affiliated with the NBV

The Biodynamic beekeepers workgroup has 14 regional groups. The BD beekeepers are mostly “disorganized” and therefore not registered. The non NBV-affiliated beekeepers mentioned above, can partly be found in the ranks of the BD beekeepers, but members of the BD beekeepers workgroup also overlap with the NBV-membership list.

4 Numbers of beekeepers and Certification

In 1945 there were up to 32,000 beekeepers that were somehow organized. This huge number dropped very fast to a nadir of 7,100 beekeepers in 1967. Up to 1984 the numbers gradually increased, but after that the numbers slowly dropped again to the 6,000 organized beekeepers we have nowadays.

As we speak, the Netherlands has only 15 professional beekeepers left. These are mainly “Pollination-beekeepers”. These beekeepers are hired by farmers to place hives on their land in order to obtain proper natural pollination. This is customary in orchards, glasshouses and seed-cultivation farms.

Beekeepers can obtain a certification from two different organisations for respectively Organic or Biodynamic certification.

With Organic-certification the beekeeper is allowed to use the “EKO quality label” on his products.

Organic Certification

Since March 21, 2015, it is possible for Dutch beekeepers to get a certification from the organisation named “Skal”. In the Netherlands “Skal” is designated by the government as the organisation for quality control and certification for the whole organic sector.

Only after a transition period of one year minimal, the beekeeper is allowed to sell his/her honey as organic. The organic regulations for the beekeeper are very strict. The regulations dictate among other things, the placement of the hives in the foraging area and the use of natural materials for the hives. The regulations are so strict that it is almost impossible to obtain the organic certification in the densely populated Netherlands. After detailed discussions between “Skal”, beekeepers and the government's department for economic affairs, there was success in coming up with a workable interpretation and set of regulations for the Netherlands with full respect for the European legislation involved.

Nevertheless, organic beekeeping can only be achieved in very limited spots. The beekeeper must set up his/her apiary in a place where the sources of nectar and pollen, within a 3 kilometer range, is originating from more than 50% of organic crops and/or natural vegetation that is only managed with the smallest environmental impact possible. The beekeeper must map the full forage area of his bees and the onus of proof that the area satisfies the regulations for certification lies with the beekeeper.

Organic beekeeping is of course not only about the foraging area surrounding the apiary. Also the use of natural materials, respect for natural living behaviour (e.g. no wing clipping of the queen) and supportive feeding with organic products are elements of the strict regulations.

Detailed information on the Certification program can be found in:
https://www.skal.nl/assets/Infobladen/infoblad-biologische-bijenhouderij.pdf

BioDynamic Certification

To obtain biodynamic certification, the beekeeper must fulfill the set of regulations of the “Demeter standard”.

The most important regulations applied are:

- The bees use winter honey stores consisting, when possible, of their own Demeter standard honey;
- The bees forage in nature reserves or on land owned by biodynamic beekeepers or farmers;
- Reproduction of colonies takes place in the natural way, including swarming;
- The bees build their own combs.
- The base for beekeeping lies in the recognition of and respect for the coherence between the animal kingdom, nature and the cosmos.

Detailed information on the Certification program can be found at:
http://www.stichtingdemeter.nl/demeter/demeter-keurmerk/

5 Bee Health

Honeybees in the Netherlands are under continuous threat from external stress factors that undermined the vitality they possessed since ancient times.

On the one hand the bee has to cope with all the chemicals that find their way into the hive and on the other hand they live in a country that lacks enough flowering plants, trees and bushes throughout the year. Nowadays, the Dutch honeybee lives on the brink of starvation and/or extinction in the natural habitat and needs “Intensive Care” treatment. Awareness of the wants and the needs of the honeybee is crucial for their survival.

Wageningen University and Research (WUR) has conducted studies on bee health for years. They get a lot of their research data from the NBV-members through annual surveys and shared information. Together with “Naturalis” and “Wageningen Environmental Research”, Bijen@WUR works in a consortium that investigates winter losses among Dutch honeybees. The consortium’s project goes under the name “Surveillanceprogram honeybees”.

The bees themselves are checked for diseases by Bijen@WUR and the beekeepers are surveyed on their beekeeping practices. Naturalis looks at the suitability of the environment for the honeybee and Wageningen Environmental Research looks at the food pollution by analysing the pollen in bee-bread. All these factors can be of influence on the winter losses of honey bee colonies.

The winter losses of registered bee colonies is done because survival of the winter is considered a good measure for the vitality of bee colonies. The normal winter losses in the Netherlands were, before the introduction of the Varroa mite, about 6.5%, but for the last ten years the percentage of winter losses varied around 20%.

The 2015-2016 winter losses appeared to be reduced to the normal percentage of 6,5% for the first time in years.

Table 3. Winter mortality figure 2005-2016.

Winter	Number of beekeepers	Number of hives (October)	% winter mortality[1]	Method
2005-2006	737	7.050	26.3	NBC [CoLoSS]
2006-2007	1422	13.591	15.9	NBC [CoLoSS]
2007-2008	808	9.616	23.7	NBC [CoLoSS]
2008-2009	1193	10.678	21.7	NBC [CoLoSS]
2009-2010	1326	11.265	29.1	NBC [CoLoSS]
2010-2011	1541	13.726	21.4	NBC [CoLoSS]
2011-2012	1673	14.915	20.8	NBC [CoLoSS]
2012-2013	1589	13.920	13.7	NBC [CoLoSS]
2013-2014	1594	15.280	8.6	NBC [CoLoSS]
2014-2015	1549	14.650	13.7	HB-Surv [CoLoSS] [1]
2015-2016	**580**	**5919**	**6.5**	HB-Surv [CoLoSS] [1]

[1]based on HB surveillance reports: 14-15 NCB voluntary survey, 15-16NBV random sample

Because many NBV-affiliated beekeepers follow up on the advice of chemical varroa control measures, it appears that one of the bees stress factors is now in control. But it is way too soon to draw conclusions at this point about varroa being the main cause of our winter losses.

The other stressors, including chemicals, the landscape, pests, bee diseases, polluted nectar or pollen, not to mention the influence of the beekeeping practices, still have their influence on bee vitality.

The questions remains whether varroa is as detrimental for a hive as we thought so far and if varroa should be combatted with chemicals. Bringing these chemicals into a hive is of course another stressor and can be seen as fighting evil with evil. Building up a natural resistance against varroa will most probably a more sustainable solution for the future of the honeybee.

Several dutch BD beekeepers have knowledge of locations where feral colonies survived without any varroa treatment. These bees survived nevertheless, or maybe just because of the absence of chemicals. The feral colonies are established for 10 to 15 years and, on occasion, more than 20 years. Afraid of the lobby for chemical treatment, the BD beekeepers keep these locations secret.

As mentioned before, honeybees have to deal with more chemicals beside varroa treatment chemicals. There is a wide range of chemicals used in agriculture and cattle breeding, that find their way into the hive.

Below is a table about chemical residues found in bee colonies:

The table states the percentage of colonies in which the specific chemical residue was found in a level higher than the so called LOQ-level (level of quantification).

Chemical residue	2014	2015
Acetamiprid	2.2	2.8
Amitraz	8.9	2.1
Coumaphos	1.1	2.4
Dimethoate	0	0.9
Fluvalinate-tau	0	0.9
Imidacloprid	6.7	2.8
Permethrin	0	0.3
Thiacloprid	2.2	9.8
Thiamethoxam/Clothianidin	0	0.9
Neonicotinoids total	7.7	15.0
Acaricides total	7.7	5.2

For detailed information about winter mortality rates, chemical residues and the way the research was conducted, we refer to a document called “Report Honeybee Surveillance Program the Netherlands”. A link can be found in the references at the end of this peace.

Beside winter mortality rates as a measure for colony vitality, the build up of the broodnest gives another indication of the vitality and health of the bee-colony. A very disturbing development found in the Netherlands is the rise of failing queens. The young open mated queens come back to the colony but, after that, the new colony is not able to successfully establish a new broodnest. The contributing factors for these “Queen failures” and the root causes are not yet clear. The physical strength of the drones, quality of the eggs or sperm, birth defects to the reproductive organs etc. might play a role beside possible chemical causes. But also the constant interference of the beekeepers in the natural ways of reproduction can be a contributing factor.

The Dutch word for beekeeper is “Imker”, referring to the word “Imme” which is the super organism or whole being of the bee-colony including the hive and the surrounding land with all its flora and fauna. The word “Imme” is the same thing as the German word “Bien”, which is also used by some English speaking beekeepers.

The BD beekeepers try to take good care of “the bien” in order to support bee health. The recognition of the inseparable conjunction of all these components of the bien, might be the key to full recovery of bee health…

6 Apis Mellifera in the Netherlands

In the Netherlands we know different subspecies of honeybee from the species *Apis mellifera*. The most popular are Ligustica, Carnica, Buckfast and the dark European bee. Because many beekeepers allow open mating of the queens we have a lot of colonies that are not of pure breed. The characteristics of these colonies can be very variable in terms of appearance and behaviour.

Below a short description of these subspecies, with the most attention for the local dark bee because that is the one most adapted to our region.

Apis mellifera ligustica

A subspecies with a predominantly yellow colour, originating from the southern Alps and Italy. These “Italian bees” have adapted to the Mediterranean climate and cannot handle the cold winters and the cool wet springs of our northern regions very well.

The winter-clusters are not very compact, which leads to more heat loss than the other subspecies experience. They tend to keep a large broodnest until late in the season. This is a risk in the Dutch climate because this interferes with the timely build up of winter honey stores.

The ligustica is a very docile bee that is not quickly enticed to sting the beekeeper and it has a low tendency for swarming. These characteristics made the Italian bee a popular one for the beekeepers for a long time. Unfortunately the subspecies has also different characteristics that cause a lack of vitality in our region, which makes them prone to different diseases.

Apis mellifera carnica

A subspecies with light brown rings on the abdomen and short hairs of mainly a grey colour, originating from Austria south of the Alps, Hungary and the Balkan region. It is sometimes referred to as “the grey bee”. The Carnica bee is a very gentle bee that made it popular with beekeepers because it was easy to “work with them”. Gentle to handle, the Carnica is resilient to other insects and has a good resistance against bee diseases and parasites.

The spring build-up starts early and is very fast, but when the nectar flow diminishes the broodnest will soon fall back to a smaller sustainable size. This property is an advantage in regions where the nectar flows strongly varies during the season. The Carnica has a tongue that is slightly longer than the one of the dark European bee which gives her an advantage over the dark bee when foraging on flowers like Clover. But when foraging on the late summer flows (eg. heather) she has to acknowledge the superiority of the dark bee.

The winter clusters are relatively small, but still the Carnica is resilient in a climate with long winters.

The Buckfast bee

The Buckfast bee is a hybrid originating from a breeding program with different subspecies of *Apis mellifera*. This breeding program was set up by brother Adam, an english monk from Buckfast Abbey in south Devon,, who bred and selected bees with specific characteristics since 1919.

On his search for specific characteristics, brother Adam had travelled through Europe and Africa collecting breeding material from different bees. He cross bred his queens with this foreign material with the sole purpose of eliminating unwanted properties and to obtain or reinforce the most desired properties.

The main unwanted properties were: stinging, strong tendency to swarm and the use of propolis. The label "unwanted" was especially aimed at the comfort of the beekeeper when working with his bees and the yield of honey.

Buckfast colonies tend to have very large brood nests and can have an almost explosive growth of the colony under the right conditions while the tendency to swarm stays low. A Buckfast colony can grow up to a size 80,000 bees in summer. In winter the colony will have approx. 20,000 bees or less. It is no exception that the hive-bodies used in winter have to be supered with up to 7 boxes to give the colony enough space for the broodnest, the workers and the honey produced.

In the Netherlands there is an mating station for virgin queens installed at the island of Marken that is situated in the central lake of the country. Many beekeeping organisations that favour the Buckfast bee, organize the spread of F0 and F1 queens over the country.

Because the Buckfast hybrid is relatively so young, the kinship with the subspecies it came from is still very strong. The Buckfast is not a race or subspecies that can maintain its genetics without human intervention. In the case of natural insemination at one's apiary, where the young Buckfast queens are allowed to mate with the drones of their choice, the new colonies often lose their Buckfast properties very fast. This results in a constant dependence on the beekeeper to remain "pure", which is in great contrast to the locally adapted black bee which, as described below, occurs naturally and is well adapted to local conditions.

The north European dark bee / the black bee

The dark European bee of the subspecies *Apis mellifera mellifera* was the original subspecies of the honeybee that was present in the Netherlands. This dark bee has several strands/ecotypes that adapted to local conditions. Due to the lack of physical barriers in the landscape, the ecotypes stayed connected. That is why some specific characteristics can be found in different ecotypes.

One of the first studied and described ecotypes of the European dark bee was "*Apis mellifera mellifera nigra*". This bee was found in the alpine regions of Austria and Switzerland and is sometimes referred to as the original black bee. But other ecotypes like the heather bee "*Apis mellifera mellifera lehzeni*", can be just as black as nigra.

Nowadays all ecotypes of the North European dark bee are referred to as "the black bee" and this term is used for the whole subspecies of *Apis mellifera mellifera,* regardless of the ecotype involved.

The black bee is fully adapted to the climate and conditions of the north European region with some important physical characteristics. The very dark pigmentation gives a fast warming-up of the bee body by the sun and the slightly bigger body combined with longer hairs ensures that the heat can be longer retained. These properties allow the black bee to fly in temperatures from 5.5 degrees Celsius (41.9 °F). This makes foraging possible from early spring until winter. During the season it also allows them to start their hard labour at an early hour and they will fly almost until sunset, even on a colder day.

In the course of time the black bee gradually became accustomed to periods without food by an important physical adaptation. The black bee has the ability to regulate the accumulation of proteins in its body. This comes in handy when breaks in the nectar flow occur and of course in winter. The most visible part of this adaptation is the so called winter bee. This bee has a much longer lifespan than the summer bee of the same colony. Because there is virtually no brood to care for during the winter months, the winter bee can use all of the accumulated proteins for her own body.

This adaptation is in contrast with the southern/African subspecies of *Apis mellifera*, who are less capable of storing proteins. In times of shortage these bees tend to form migratory swarms. These swarms have nothing to do with reproduction, instead they aim solely at survival of the established colony. Other apis species, like *Apis cerana*, also use this survival strategy.

The black bee can react somewhat agitatedly when there is too much manipulation by the hand of the beekeeper, but its true nature is friendly. In the past when the only the black bee was present in the Netherlands, the beekeepers worked with their bees without any trouble whatsoever. As time passed and the import of foreign bees started, the black bee slowly but surely fell out of favour because it was labeled "bad tempered", "prickly" or even "vicious". However, historic pictures of a dutch bee-market tell a different story.

No doubt the black bee was a bit less docile than the imported bees, but it appears as if crossbreeding with the imported bees in fact resulted in more prickly colonies of the black bee. The unpredictability of colony temperament with open mated queens from "pure bred" colonies of other *Apis mellifera* subspecies seems to confirm this.

The build-up of the broodnest starts in February and in the Dutch climate this is mostly before the bees can fly out for the first time. In March and April the broodnest will grow progressively with its peak in May, the month wherein swarms can be expected. The black bee is renowned for its higher tendency to swarm in comparison to other subspecies.

The broodnest will shrink during breaks in the nectar flow, but towards the end of summer it will peak again. In this period the winter-bees are born.

The black bee enters the winter period with approx. 15,000 to 20,000 adult bees and forms, depending on the temperature, a more or less compact cluster. The winter-bees will bring the

colony through the winter and will live up to March. From then the next generation of worker bees takes over.

The locally adapted bee

If we put aside all the interests of the beekeeper and just look at the honeybee, we see that it is crucial for the bee to be highly adapted to the environment that surrounds the colony. Both physical and behavioural characteristics contribute to successful survival.

Even in the Netherlands, that is relatively a small country, we have different circumstances to which the honeybee has to adapt. The temperature, the humidity and the availability of nectar and pollen bearing flowers will influence the success rate of each colony. The better the colony is adapted to the local conditions, the more vital the colony will be. And only a vital colony can withstand hard times, pests and bee-diseases.

Keeping “pure bred” bees is hardly an option in our small country since we have hardly any natural barriers to contain populations and open mating is allowed throughout the country. Only when the virgin queens are shipped to special fertilization stations on an island, is it possible to obtain a pure bred queen. Only on the island Texel, north of the mainland in the “Waddenzee”, does an isolated population of black bees exists. The almost pure black bee colonies are maintained by enforcing a strict import ban for honeybees on the island since 1984.

Although the black bee was the original bee in the Netherlands, it cannot be claimed that the pure form of this subspecies is the best bee for the Dutch environment and beekeeping at this point in time. The circumstances have changed so drastically by the hand of mankind that the future of the Dutch honeybee most probably lies with the “locally adapted bee”.

Below it is clear to see that bees from one apiary and even bees from one hive can have very diverse appearance.

In this first picture it is clear to see the difference in physical appearance of “sister lines” within one colony (workers coming from the same queen, but the offspring of different drones).

This is a bee from the same apiary with a moderate brown colour and clearly visible rings and hairs on the abdomen.

Another colony from a swarm that flew into a bait hive has a percentage of almost pitch-black bees. Regarding the vitality of this colony and the behaviour of the individual black bees, this black abdomen is most probably not a symptom of a disease but merely a very dark genetic line (blackening of bees can occur when they are infected by tracheal mites).

Time will tell which genetic and behavioural properties of the locally adapted bee will justify their presence in nature. The principles of biodynamic beekeeping have to support this natural selection. Although it will likely not be identical to the black bee, probably not many people will be surprised if the future locally adapted bee has many features in common with the original black bee.

7 Commercial beekeeping

Due to our climate and the shortage of big nectar flows, the Netherlands is no longer suitable for commercial beekeeping, especially not for honey harvesting. At this moment we have only 15 commercial beekeepers in the Netherlands. Some beekeepers aim at a honey yield from the heathlands because this honey has a highly appreciated taste. Others aim at the fruit cultivation for their honey yields.

Beside beekeeping for the honey, there is an alternative that brings in money: pollination. Pollination-beekeepers rent their colonies to farmers that own orchards and/or glasshouses. During the main flowering period of the crops and trees, the bees remain at the location for several weeks to guarantee optimal pollination. The owner of the land pays the beekeeper for this service and the beekeeper keeps the honey as a bonus. After the agreed period the bees will be moved to the next location.

But the growing number of hobby-beekeepers are threatening the few commercial beekeepers since many of them are in need of a good place for their apiary. The use of a small part of the property for an apiary in exchange for free pollination is a good deal for farmers.

The main bee-products we know in the Netherlands are honey and wax. Other bee-products like royal jelly, propolis and pollen are available to some extent, but they are mostly shipped in from abroad.

8 Hobby beekeeping

In recent years the number of hobby beekeepers has increased substantially. Due to media coverage of the dramatic decline of the honeybee population, many people felt obliged to do something for the bees. The first logical step is in many cases the desire to become a beekeeper in order to help them.

Hobby beekeeping is so popular at the moment that, in many places, we have more colonies than the land can sustain. There is simply not enough food and the hives are too close to each other.

Because the younger generation is brought up with very limited knowledge of honeybees, the bee is mostly just associated with honey and bee stings. For Dutch people it is quite a thing to befriend honeybees. That is why most of them start with the basic training in beekeeping provided by the dutch beekeeping organisation (NBV).

The basic training provides the novice beekeeper with a theoretical background regarding the life and behaviour of the honeybee. Beside this, the pupils will attend some practical lessons. Partly to overcome their imprinted fear of the honeybee in a controlled situation, but mostly to gain insight in the year round lifecycle of the bee colony.

The basic training is based on the conventional way of beekeeping for honey. The interests of the beekeeper mainly prevail over the wants and the needs of the bee colony.

The training program consists of the following subjects:

- Methods for swarm prevention / making artificial swarms
- Choosing queens and introducing virgin queens
- Queen rearing by different methods
- Cutting drone comb
- Brood diseases and other bee diseases
- Chemical pest control
- Harvesting honey and feeding with sugar water

After this year of basic training there is a wide range of additional training available. Most of this is based on active manipulation of the colonies. As an example: training on the rearing of queens from young larvae and a training in artificial insemination of queens.

The hobby beekeepers all pursue beekeeping in their own way, from very intensive manipulating to more respectful treatment, from working with one hive to working with a real apiary and from honey driven to bee-centred husbandry.

Depending on personal insights and experiences, the number of people choosing the biodynamic way of beekeeping is rising in the Netherlands.

9 Biodynamic Beekeeping / Ecological beekeeping

The offer of BD beekeeping training programs is gradually increasing and even some regular beekeeping organisations start to offer BD training next to the conventional training program.

At some points BD beekeeping clashes with the conventional way of beekeeping. This depends on interests, different insights, worldview but also on opinions. BD beekeepers are sometimes looked upon as odd people, who discard of all the achievements of the conventional way and ignore scientific proof.

The dutch BD beekeepers ignore this and carry on doing what they are doing without the need to prove the others wrong. It is their strong belief that BD beekeeping is the only sustainable way of beekeeping, and their results tell the story. The lack of registration amongst BD beekeepers causes a blind spot in the scientific research data because the findings of the BD beekeepers stay disregarded or withheld in their ranks. However, thanks to the internet more knowledge of the “odd-ones” is shared and some BD findings are confirmed with scientific proof, bringing the two worlds of beekeeping closer together.

BD beekeeping has a few basic principles regarding the undermentioned subjects:

General rule

The well-being of the honeybee is what comes first and the harvest of bee-products, if any, must never harm the colony. The bees should, whenever possible, always have their own honey as winter stores.

The principle of “no interference” in the natural order of things concerning colony reproduction plays an important role.

Housing

The bee-colonies are placed in a rich environment with minimal pollution, as much as possible, and moving the bees from place to place is not done.

Many types of bee housing are used but, regardless of the type, there is a commitment to the use of only natural material for the construction of the hive as well as the materials used inside the hive.

The ideal is bee housing with enough space for the creation of an undivided broodnest.

The colony and its development

The bee colony is regarded as one being, the bien. That means that the beekeeper avoids exchange of bees and comb between hives, queen introductions, replacement of brood etc..

The knowledge of the bien regarding her own wants and needs is a guideline for the beekeeper, and that is why the beekeeper allows the bien to create her own comb. In this way, the colony can determine for itself how many drones it brings up, which cell-size is fit for the worker brood and what beespace is maintained in the hive.

The BD beekeeper recognizes the role that drones fulfill in the perception and intellect of the whole colony. The drone is seen as an earth-bound creature while the queen is seen as a creature of the sun. The worker bees connect the energies of sun and the earth.

The natural development of the colony is respected as much as possible. This means that swarming is allowed during the reproductive period of the colony and young queens are always open mated. Only if swarming is not an option for the beekeeper is an artificial swarm created, but only when the bees are already in the mood for swarming. The beekeeper never interferes with the colony’s choice for a specific queen.

Unless unavoidable, the beekeeper does not “help” the colony by feeding sugar water. The bees should always come through the winter on their own honey. And in spring the development of the broodnest is never forced by supplemental feeding of sugar water.

Manipulation / disturbance

The microclimate of the hive is highly respected, and for that reason the hive is opened as few times as possible. With some methods it is only two times a year, but some beekeepers keep the hives closed all year.

The top bars or frames containing comb are preferably not exchanged with each other (either between hives or in the hive).

The use of smoke is kept to a minimum because smoke disturbs the hives internal climate and pheromone levels to such extent that the colony can be stressed for a length of time.

Many BD beekeepers try to work without any protection, trusting the bees in their relationship and willing to know if their manipulation is felt as aggravating by the bees. A sting once in a while is seen as a warning to the beekeeper that his actions disturbed the bien, instead of seeing it as aggression.

Vitality

The vitality of a colony is reached with a no interference strategy. No chemical pest and disease-control is applied in the hive, with the aim to activate the natural defence mechanisms of the bees. Considerable losses can be expected when conventional treated colonies are suddenly withheld any treatment by a beekeepers who switched to BD beekeeping. But some colonies will survive and come out stronger than ever before.

Varroa-resistance is reached by allowing the colonies their confrontation with the mite, instead of throwing poison in the hive. No colony is immune to a Varroa infestation, but every colony can learn to adapt to the presence of the mite. Whenever a colony has put its defence mechanisms in position, the Varroa mite can live inside of the colony but the colony will not perish. The adult bees will detect infected larvae and will dispose of them. They will also help each other to brush mites from their bodies. These adaptations will disrupt the brood cycle of the varroa to such an extent that the balance between host and parasite is restored.

It cannot be said that a BD beekeeper will never intervene to rescue a colony, because taking the bees from their natural habitat undermines their vitality so much already that some fights cannot be won without a bit of help. The BD beekeeper tries to compensate for this loss of vitality, caused by people, by supporting the bees with “bee husbandry”. Accommodating the bees in order to let the bien regain its original strength and vitality.

10 Beehousing

In the early days of beekeeping in the Netherlands, the honeybee was kept solely in skep hives. Multiple designs were used, mostly related with their region of origin. The skeps were made of rye straw, moor grass or withies (willow). To improve insulation and durability the hives were mostly covered with a layer of cow manure.

Below a few examples of Dutch skep hives:




With the use of skep hives came a certain way of beekeeping. Colonies were allowed to swarm but the swarms were caught back. Prime swarms were caught at the point they were leaving the hive, using a special catching bag. These prime swarms were either sold or used to populate an empty skep hive. The cast swarms were allowed to leave the hive and form clusters in the proximity of the apiary, where the beekeeper collected them using special collecting skeps. The cast swarms were used to set up new colonies with young and strong queens.

In autumn the beekeeper selected the skeps to harvest honey and shook all the bees out of the skep into a new skep. Any brood in the old hive was killed by putting the skep over a smouldering piece of sulfur. After quickly killing all the brood, the honeycombs were collected to be pressed or sold as comb honey.

Inspecting colonies in skep hives was only possible from the bottom, but this gave the beekeeper a good insight into the overall colony strength.

After a while the way of beekeeping changed due to the introduction of the modern boxe hives with frames. The colonies were highly accessible without totally breaking up the colony's development.

The modern BD beekeepers acknowledge the importance of the hive characteristics in relation to the wellbeing of the bien.

Although BD beekeeping does not exclude the use of modern box hives, a wide range of other types is preferred because of their specific property of accommodating one undivided broodnest. Top bar hives, einraumbeute, skeps and sun hives are popular hives, but the log hive and tree beekeeping gain interest because of their bee-friendly properties. Keeping the right temperature and moisture in the hive during all seasons is very important for the bees, so the BD beekeeper mostly puts this above his own convenience when choosing a hive.

11 Additional information about natural comb

In BD beekeeping, the importance of naturally built comb is well known. As mentioned earlier, the worker bees can create combs and cells adapted to the need of the colony.

The drone cells are made bigger then the cells for worker brood. This difference is not there when pre-rolled wax sheets (foundation) is used. In natural comb we can see that the building of drone cells is mostly on the outside of the combs and away from the center of the broodnest. There seems to be a strong relationship between the size of individual cells and the infection rate with varroa. Varroa tends to prefer the bigger drone cells. Keeping the drone brood away from the worker brood has most probably a protecting effect on the core of the broodnest.

By not using wax sheets from recycled wax, the new comb will always be as pure/clean as possible. There is no old accumulation of pesticides and other chemical pollution in the wax (eg from beekeeper treatments of varroa).

In hives where the beekeeper offers the bees empty frames or top bars on which to build their comb, the centre line distance is 35 mm for the broodnest area and 38 mm for the honey chamber.

In some hives, the worker bees are totally free to build their comb structure for the colony. In these hive one can find different depths of cells, but also a variety in beespace (the space between the combs). In places where the bees don't have to work a lot they keep a smaller beespace, probably to help heat retention in the structure.

The centre line distance in a free comb structure may vary from 33 mm up to 47 mm. Studies show that, despite the big variance, spikes will be found between 35/36 mm and 40 mm. These spikes probably resemble percentages used for specific goals and the main preference of the bees.

Producing wax is very "expensive labour" for the colony. The production of 1 kilogram of wax will cost the energy equivalent of 4 – 6 kilos of honey. This is why comb is sometimes recycled by bees. They nibble old comb and use it on other places when needed. Queen cells are always made of old wax.

Natural comb has a much thinner center wall than combs build on wax foundation sheets. Recent studies revealed that honeybees use long distance communication inside the hive by sending vibrations through the comb. The comb structure allows a very precise transmission of signals and makes it even possible for a bee to locate the sender of the message on the comb. This communication is only possible on natural comb.

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Heathland Beekeeping (annual cycle highlights and work)

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